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The interplay between historical thinking and epistemological beliefs: A case study with history teachers in Flanders

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ABSTRACT

History teachers' epistemological beliefs are considered to be greatly influential on their instructional practice and a necessary requirement to foster their students' historical thinking skills. In examining this relationship, two issues arise. First, adequately capturing teachers' epistemological beliefs remains a challenge as existing instruments appear not to be always valid and reliable. Some researchers suggest to distinguish between formal and practical epistemologies, which requires different measuring instruments. Second, it remains unclear how teachers' epistemological beliefs influence their teaching practice as several studies found there is no straightforward relationship due to the influence of other beliefs. At the same time, the role of teachers' own understanding of historical thinking in fostering this thinking among their students has not been extensively studied.

Through a qualitative research with 21 history teachers, this study examines the relationship between teachers' formal and practical epistemologies, their understanding of historical thinking and their instructional practice. It thereby reflects on methodological issues related to mapping teachers' epistemological beliefs.

Data analysis shows that teachers' epistemological beliefs remain difficult to capture, due to inconsistencies in and between measuring instruments. It could be concluded, nevertheless, that, while most teachers acknowledge the interpretive and constructed nature of history, they generally do not include this in their own descriptions of historical thinking. The research supports the idea that nuanced epistemological beliefs are required for interpretive history teaching, but are not a sufficient precondition. While other beliefs and contextual factors are indeed at play, it also appears necessary to support teachers' competence in designing materials to foster their students' historical thinking, including epistemological reflection. The article reflects on the implications for teaching training and professional development programs.

KEYWORDS

History education, epistemological beliefs, formal and practical epistemologies, instructional practice, historical thinking

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Introduction

Epistemological beliefs touch upon the core of every discipline and its functioning. They include beliefs about the nature of knowledge, the (un)certainty of knowledge, and the nature or processes of knowing, related to sources of knowledge and the reasoning and justification processes involved (Buehl & Alexander, 2001; Hofer & Pintrich, 1997).

Epistemological beliefs play an important role in the discipline of history. For a long time, a "realist" epistemological paradigm was the norm whereby historians believed it was possible to reconstruct the past exactly as it happened, by applying disciplinary methods. From the 1980s onwards, a shift occurred towards a perspectivist epistemology, paying more attention to the constructed and interpretive character of historical knowledge (Munslow, 1997). This perspectivist approach also became dominant in history education, which is particularly manifest in the central position occupied by historical thinking in history education in many Western countries (Lévesque & Clark, 2018).

Historical thinking combines "knowing history" and "doing history" in order to generate a deep historical understanding. Knowing history refers to the acquisition of substantive knowledge of the past; doing history refers to procedural knowledge in history, to building an understanding of how historical knowledge is constructed (Havekes, Arno-Coppen, Luttenberg, & van Boxtel, 2012; van Drie & van Boxtel, 2008). Building on earlier and novel research on historical thinking in the United Kingdom (conducted by scholars such as Denis Shemilt, Peter Lee, Alaric Dickinson and Rosalyn Ashby) various models have been developed that further operationalize historical thinking. One influential model is that presented by Seixas and Morton (2013) who distinguish six historical thinking concepts describing "the way historians transform the past into history" (p. 3). Another model focuses on historical literacy (Wineburg, 2001). In a European context, influential models are those devised by van Boxtel and van Drie (2008) and the model developed by the German FUER group, which distinguishes between four historical competences (Körber & Meyer-Hamme, 2015). Although these models differ in their concrete operationalization of historical thinking, they are based on a common element, namely revealing the interpretive and constructed nature of history by giving students an insight into the methods of historians, through the use of sources and the application of (characteristic) historical methods of reasoning.

Historical thinking, however, constitutes an "unnatural act" (Wineburg, 2001), implying that teachers play a particularly important role in students' learning process in this respect. The fact that teachers themselves have nuanced epistemological beliefs, in line with a perspectivist approach to history, is considered a necessary condition to enable them to convey this to their students and enhance their students' historical thinking skills (Wansink, Akkerman, & Wubbels, 2016; Yilmaz, 2008).

Various models exist which capture teachers' (and students') epistemological beliefs, both on a general and discipline-specific level. A number of influential models are presented in Table 1.

TABLE 1: Generic and Domain-specific Epistemological Models
(adapted from Maggioni et al., 2009, p. 196)

	Generic models		Discipline-specific models		
	King & Kitchener, 2002	Kuhn, Cheney & Weinstock, 2000	Lee & Shemilt, 2003	Nitsche, 2016	Maggioni et al. 2004; Maggioni et al. 2009
Naive beliefs: the past is given, knowledge is fixed	Prereflective	Realist Absolutist	Pictures of the past Information	Positivism	Copier stance
Knowledge about the past is uncertain, accounts are subjective	Quasi-reflective	Multiplist	Testimony Scissors and paste	Skepticism	Borrower/ subjectivist stance
Nuanced beliefs: the past is constructed and interpretive, based on disciplinary tools	Reflective	Evaluativist	Evidence in isolation Evidence in context	Narrative constructi-vism	Criterialist stance

Table 1 shows that these models use different names to describe epistemological beliefs. In general, however, we can observe a distinction between naive and more sophisticated, nuanced beliefs. People holding naive beliefs consider knowledge as fixed and singular, and ignore the existence of multiple perspectives and interpretations. Another instantiation of naive beliefs is the consideration of historical knowledge being purely subjective, thereby reducing history to a mere opinion. Advanced, nuanced beliefs only occur when history is considered as interpretive and constructed, when it is accepted that knowledge is subject to change and that claims about the past can be assessed based on disciplinary criteria (Kuhn, Cheney, & Weinstock, 2000; Maggioni et al. 2009; Stoel, Logtenberg, Wansink, Huijgen, van Boxtel, & van Drie, 2017). They require a "coordination of the subjective and objective dimensions of knowing" (Kuhn et al., 2000, p. 311).

History teachers' epistemological beliefs are important in order to understand their instructional practice. It is therefore important to map them accurately. In this context, however, two difficulties arise. A first is related to measuring teachers' epistemological beliefs, a second to the relationship between epistemological beliefs and teachers' instructional practice.

Measuring history teachers' epistemological beliefs

A first difficulty is that it is complicated to map history teachers' epistemological beliefs. Maggioni, VanSledright, & Alexander (2009) developed an instrument based on a synthesis of existing (progression) models and literature on the development of historical thinking (Maggioni et al., 2009). The Beliefs about Learning and Teaching History Questionnaire was initially administered to elementary teachers and college history professors. An adapted questionnaire (the Beliefs about History Questionnaire, or BHQ) was developed to assess students' epistemological beliefs (Maggioni, 2010) and has become a widely used instrument (Stoel et al., 2017). Although this is a validated questionnaire, several researchers experienced difficulties in replicating the results, and/or in assigning teachers, and students, to one of the three stances (Stoel et al. 2017; Voet &

De Wever, 2019; VanSledright & Reddy, 2014). The items relating to the subjectivist stance, in particular, are problematic, because recognizing subjectivity can suggest both naive and nuanced beliefs (Stoel et al., 2017).

Therefore Stoel et al. (2017) tested an alternative questionnaire based among other things on items from the BHQ (Maggioni, 2010). They tested a simple distinction between naive and nuanced ideas, where items related to subjectivist beliefs would be divided between naive and nuanced ideas. Naive ideas were characterized among other things by statements referring to historical knowledge as fixed and singular, literally embedded in sources, or uncertain and personal. Nuanced ideas were related to statements describing historical knowledge as interpretive yet bound by disciplinary methods and criteria (Stoel et al., 2017). They conducted their research among students in the 12th grade, and also presented their statements to experts in the field of history. They were, however, unable to separate naive and nuanced subjectivist items; the factor analysis resulted in three subscales: on a naïve level, one subscale was labelled "nature of knowledge – objective" and "nature of knowing – naive", both related to objectivist beliefs. On a nuanced level, no distinction was found between beliefs about the nature of knowing and those about the nature of knowledge. Instead, nuanced beliefs were captured in one subscale, labelled "nature of knowing – nuanced". Agreement with this subscale meant respondents valued disciplinary "procedures to interpret sources and construct reliable claims" (Stoel et al., 2017, p. 131). For this reason, the subscale was relabelled "historical methodology". Students were sometimes found to agree both with this subscale and with the subscale "nature of knowing – naive", indicating a "procedural objectivist" stance in which students "value historical-thinking skills because they believe that these skills make it possible to separate true and false sources and could generate true and fixed knowledge" (Stoel et al., 2017, p. 131). Interestingly, the two subscales related to naive, objectivist beliefs were answered as one factor by experts, and were both strongly rejected. Hence, they hypothesize that an increased epistemological understanding might be characterized both by an acceptance of items related to the importance of historical methods and by the degree to which they reject the naive, objectivist subscales related to the nature of knowing and the nature of knowledge.

Given these methodological difficulties, some researchers have called for the development of different measuring instruments. According to Kuhn and Weinstock (2002), epistemic thinking should be understood as "theory-in-action" (p. 134): peoples' "tacit theories" about knowledge and knowing are activated when they are confronted with a specific claim, problem and sources of information. A distinction should hence be made between formal and practical epistemologies (Sandoval, 2005; Sinatra & Chinn, 2012). Formal epistemologies refer to general ideas about the "characteristics of knowledge and its justification in a particular field" (Sinatra & Chinn, 2012, p. 264), while practical epistemologies refer to epistemic practices that are activated, for instance, via inquiry activities. Formal and practical epistemologies are not necessarily aligned. Sinatra and Chinn (2012) remark that beliefs about knowledge in general may be inconsistent with epistemic practice. Within the domain of history, formal epistemologies might be accessed via questions gauging respondents' conceptualization of history as a discipline (e.g. Yilmaz, 2008). Practical epistemologies refer to the actual reasoning and thinking that is at play when someone is engaged in a discipline-specific task, for instance when confronted with a historiographical debate or conflicting sources. Accessing practical epistemologies hence requires instruments that provoke reasoning about concrete problem scenarios (Barzilai & Weinstock, 2015). Kuhn et al. (2000) developed a short paper and pencil assessment based on conflicting statements on various knowledge domains, which they stated corresponded well enough with results from an interview-based assessment to justify its use.

The use of contrasting statements as a measure of epistemic thinking among history teachers has not been broadly researched. Yet several scholars emphasize that this might be beneficial in overcoming the issue related to measuring history teachers' epistemological beliefs, as well as to the need for studies triangulating different instruments (Stoel et al., 2017; Voet & De Wever, 2019). Finding a reliable and valid paper and pencil assessment for measuring epistemological beliefs, however, remains a major challenge to date.

Assessing the relationship between teachers' epistemological beliefs and instructional practice

A second difficulty is that it is unclear exactly how teachers' epistemological beliefs influence their instructional practice. Some studies have found a relationship between epistemological beliefs and instructional practice. Yeager and Davis (1996), for instance, found teachers who perceive history as a construction to be more likely to favor heuristic approaches, such as analysis and interpretation, whereas teachers who regard history merely as an univocal account were more likely to use sources solely to extract information from. McCrum (2013) found teachers' recognition of the constructed nature of history to be associated with a more student-centered pedagogy and learning activities. However, several studies show that nuanced epistemological beliefs are not a sufficient condition for an instructional practice that pays attention to interpretive history teaching (e.g. Hartzler-Miller, 2001; VanSledright, 1996; Voet & De Wever).

Thus, there does not always appear to be a correspondence between history teachers' epistemological beliefs and their instructional practice. In this respect, Maggioni and Parkinson (2008) make mention of a "double epistemic standard" (p. 453) among teachers in different disciplines. While teachers might acknowledge the constructed and incomplete nature of disciplinary knowledge, they sometimes consider "school knowledge" (the knowledge students encounter in school) as fixed and complete. Hence, they adhere to different formal epistemologies when it comes to disciplinary and school knowledge. Wansink, Akkerman, Vermunt, Haenen, & Wubbels (2017) and McDiarmid (1994) found evidence for the existence of this double epistemic standard among students and prospective history teachers.

This incongruity highlights the importance of other factors that influence this relationship, and their connection in a belief system (Nespor, 1987; Pajares, 1992). Within history education, research has already been carried out into (prospective) teachers' beliefs about the goals of history, the teaching and learning of history and the influence of contextual factors such as the available time, teachers' access to didactic materials, curricular requirements and the presence of standardized tests (e.g. Barton & Levstik, 2004; 2003; Hicks et al., 2004; Husbands, 2011; Van Hover & Yeager, 2003; VanSledright & Limón, 2006; Voet & De Wever, 2019; 2016; Wansink et al., 2016). It shows that various beliefs and contextual factors interact with and influence instructional practice. Nitsche (2019) frames the relationship between theoretical and didactic beliefs about history and practice within a set of internal (e.g. beliefs about students) and external (e.g. curricular) factors.

One factor that is often ignored in these studies is teachers' own understanding of historical thinking. Since historical thinking is a broad and complex concept, it can be assumed that this understanding will vary. Research into teachers' conceptions of inquiry-based learning in history confirms this and suggests that these understandings influence instructional practice (Voet & De Wever, 2016). It therefore seems important to map teachers' understanding of historical thinking as well. To what extent, for instance, do teachers consider epistemological reflection as part of historical thinking, and how does this relate to their epistemological beliefs and instructional practice?

In this latter respect, an additional difficulty arises in adequately capturing teachers' instructional practice. Some small case-studies rely on extensive classroom observations (e.g. Hartzler-Miller, 2001; Martell, 2013; VanSledright, 1996), while others rely on teachers' beliefs about instruction (e.g. Voet & De Wever, 2016) or self-reported practices, gathered through interviews (i.e. McCrum, 2013) or Likert-type statements (i.e. Hicks et al., 2004; Voet & De Wever, 2019). While lesson observations are very time-consuming, self-reported practices only provide an indirect insight into teachers' practice. Voet and De Wever (2016) therefore recommend complementing interviews with lesson observations or an analysis of the learning materials actually used by teachers.

Aims of this study

This study examines teachers' epistemologies, their understanding of historical thinking and their instructional practice, thereby taking into account the issues discussed above. The guiding research questions are:

RQ1: What do teachers' formal and practical epistemologies look like and how do these relate to their understanding of historical thinking? This research question will also address methodological issues related to the measurement of teachers' epistemological beliefs.

RQ2: How are teachers' epistemological beliefs and understanding of historical thinking reflected in their instructional practice?

Research design and methodology

A qualitative study was set up with 21 history teachers teaching in the 11th-12th grade of secondary education. Data collection took place during March-June 2019. The call for participation was distributed through contacts of the teacher training and pedagogical counsellors, but did not mention the specific research topic, so as to avoid selection bias. The research was presented as an examination of history teachers' opinions and practices.

Research context

The study was conducted in Flanders, the northern part of Belgium. History education is part of the basic curriculum of general (2h/week) and technical (1h/week) secondary education. The standards, issued by the Flemish Ministry of Education, do not differ much between them. They assign teachers a lot of freedom: they do not impose specific content, yet only prescribe which time period should be studied in each stage (e.g. the 11-12th grade deal with the period ca. 1750-present) and require teachers to cover political, economic, social and cultural themes. Also, the government does not organize central examinations or exercise state control on history textbooks (Van Nieuwenhuyse, 2020).

The standards only set historical thinking implicitly as a goal: they do not conceptualize nor operationalize this notion. They try to connect to an academic, disciplinary approach of history yet in so doing bring a rather 'realist' approach to the fore, in which it is assumed that following disciplinary methods (rigorous source analysis) leads to the discovery of 'the' historical truth (Van Nieuwenhuyse, 2020). This is evident, for instance, in the fact that they emphasize the importance of critical source analysis, but do not offer concrete guidelines or didactic support on how to foster this, nor connect it to fostering epistemological reflection (Van Nieuwenhuyse et al., 2017).

The standards date from 2000. Since 2019, new ones are gradually being introduced in which historical thinking occupies center stage and in which a perspectivist approach is dominant. In order to teach history in the 11th-12th grade, both a teaching degree and a Master's degree in history is required. Hence, almost all participating history teachers are trained historians with a good understanding of history as a discipline and acquainted with historical research methods and historical thinking. Furthermore, in teacher training, professional development initiatives and professionally oriented journals, attention is paid to (different models of) historical thinking.

Participants

Twenty-one teachers participated in the research. Six of them worked in general education (2h history education a week), six in technical education (1h/week) and nine in both levels. General education primarily prepares students for higher education in universities or university colleges, whereas technical education prepares students for higher education in university colleges as well as for the labor market. Their teaching experience varied between one and 38 years. All teachers had a Master's degree in history as well as a teaching degree. One teacher also held a PhD in history.

TABLE 2: Descriptive Information on Respondents

Respondent	Gender (male/female)	Years of experience	Currently teaching in the following educational type (general/technical)
1.	M	25	Technical
2.	M	7	Both
3.	M	3	General
4.	F	22	General
5.	M	32	Both
6.	F	15	Both
7.	F	32	General
8.	M	2	General
9.	M	30	Technical
10.	F	5	Both
11.	F	39	General
12.	M	4	Both
13.	M	13	Technical
14.	M	30	Technical
15.	M	2	Technical
16.	M	8	Both
17.	M	1	Both
18.	M	17	Technical
19.	F	17	Both
20.	F	8	General
21.	F	25	Both

Data collection

Data on teachers' general and practical epistemologies, their understanding of historical thinking and their instructional practice were collected via a questionnaire and two semi-structured interviews, which had been pilot-tested beforehand and adjusted as necessary.

Teachers first completed an online questionnaire containing two open-ended questions to gauge teachers' understanding of historical thinking: "How would you describe historical thinking" and "List five strategies you use to foster students' historical thinking abilities". The questionnaire assessed teachers' formal epistemologies through statements derived from Stoel et al. (2017). Respondents assessed fifteen statements on a 6-point Likert scale from "strongly disagree" to "strongly agree". Statements included among others "It is not possible to write adequately about history when sources contradict each other" (naive) and "In history education it is important that you learn to support your reasoning with evidence" (nuanced). Considering that the statements assessed teachers' general ideas about knowledge (construction) in history, we considered them to be an adequate measure for their formal epistemologies. As these statements were initially aimed at students, some small adjustments were made. For instance, in the statement "When something is written in your history textbook, you can assume it is true", the phrase "your history textbook" was changed to "a history textbook".

In the first interview, respondents' answers from the questionnaire were discussed. Teachers were asked to elaborate on their answers to the open-ended questions. After discussing their own understanding of historical thinking, they were presented with a model which defined historical thinking as requiring "an understanding of both the past and historical practice". That model (see Appendix A) consisted of five components, based on a synthesis of existing models of historical thinking (Seixas & Morton, 2013; van Drie & van Boxtel, 2008; Wineburg, 2001). Respondents were asked to what extent this related to their own understanding of the concept and their

instructional practice (e.g. did they recognize the aspects of historical thinking presented in the model? Were any of them new to them?, etc.).

The first interview also gauged teachers' practical epistemologies. To this end, a scenario-based approach was developed using a case study with contrasting statements. The measurement instrument required teachers to reason about a concrete, discipline-specific task, thereby providing an insight into their practical epistemologies. The measure used contrasting statements based on Kuhn et al. (2000), but added a content-rich scenario with sufficient background information, following the suggestion and work of Barzilai and Weinstock (2015). The case presented two causes for the spread of agriculture across Europe ca. 6000 BC and presented respondents with the following statements: "Only one explanation can be correct" or "Both explanations can be correct". If they selected the latter they were offered a choice between two additional statements: "Both are equally correct" or "One can be more correct than the other". Respondents' answers were further discussed by asking them to explain their choice and by follow-up questions such as "How can you explain the fact that different scholars come to different conclusions?". If teachers' answers to the statements in the questionnaire contained discrepancies, this was also discussed in the interviews. Teachers with nuanced beliefs were expected to indicate that both explanations could be correct, but that one could be more correct than the other.

After the first interview, teachers were asked to provide concrete, self-developed teaching materials, drawn from their actual teaching practice which they used to promote their students' historical thinking skills. In so doing, we provided teachers the opportunity to present what they considered to be their 'best practices' in terms of historical thinking. Teachers were asked to present the material in the second interview and to explain their rationale and teaching purposes related to the material. Questions addressed aspects such as what learning goals (including historical thinking aspects) teachers hoped to achieve through these materials, what kind of student answers they expected, how often these kinds of materials were used and how the material related to their overall instructional practice. To ensure that we were able to go beyond mere self-reported practices, we applied our own analysis of the materials after the interview. An overview of the analytical concepts in relation to the data collection instruments is presented in appendix B.

Data analysis

Data from the Likert-type items assessing formal epistemologies were analyzed quantitatively. For each respondent a mean score was calculated for each of the three subscales. Data from the interviews as well as the teaching material were analyzed qualitatively, using a thematic analysis. Codes were created inductively, data-driven and deductively. A priori codes were created for the main research themes: understanding of historical thinking, epistemological beliefs and instructional practice. An initial coding scheme was created by the first and third author. The first author conducted an initial analysis of the data and created additional, data-driven codes. The codes were discussed and defined in deliberation with the second and third author. The revised coding scheme was then applied to the data by the first author, after which the analysis was reviewed and discussed with the second and third author, leading to consensual agreement.

For the research theme "epistemological beliefs", subcodes distinguished between formal and practical epistemologies. In line with the research by Stoel et al. (2017), we employed a simple distinction between naive and nuanced epistemological beliefs in the subcodes, for both the formal and practical epistemologies.

Subcodes were created for the research theme "understanding of historical thinking", to label various aspects of the concept in teachers' own descriptions. They included, among others, asking historical questions, historical modes of reasoning (e.g. causality, significance, agency, continuity and change) and source analysis. This coding was based on a synthesis of various historical thinking models (Seixas & Morton, 2013; van Drie & van Boxtel, 2008; Wineburg, 2001) as well as the validated historical thinking observation instrument of Gestsdóttir, van Boxtel and van Drie (2018).

For the theme "instructional practice", a first set of codes identified various aspects of historical thinking in the material. Codes included among others: source analysis, multiperspectivity, asking historical questions, analyzing historical representations. As regards source analysis, subcodes were used to analyze how sources were presented and questioned, indicating for instance whether sourcing, contextualization and/or corroboration were present (Wineburg, 2001), as well as reasoning with and/or about sources (Rouet, Britt, Mason, & Perfetti, 1996). A second set of codes labelled instances where opportunities to stimulate epistemological reflection were present, or were missed. If the material did address epistemological reflection, subcodes indicated whether this reflection stimulated either nuanced of naive beliefs. For instance, if a teacher designed materials aimed at critical source analysis, but questions in the materials were only aimed at extracting information from the source (i.e. only reasoning with sources), this was coded as naïve. When the questioning of sources fostered students' understanding of history as interpretation and construction, this was labelled as nuanced.

A within-case analysis was applied to create a profile for each respondent, describing their epistemological beliefs, understanding of historical thinking and instructional practice as well as their relationship. General patterns in the data were identified using a cross-case analysis (Miles, Huberman, & Saldaña, 2015).

Results

RQ1: What do teachers' formal and practical epistemologies look like and how does this relate to their understanding of historical thinking?

Formal epistemologies

Based on teachers' answers to the statements in the questionnaire, an average score (out of 6) was calculated for each of the three subscales. The results for each respondent are shown in Table 3.

A high score on the first two subscales (columns 1 and 2) indicates rather naive beliefs, both with regard to the nature of knowing and the nature of knowledge. A high score on the last subscale (column 3) indicates nuanced beliefs. Stoel et al. (2017) do not provide specific cut-off points indicating when a score can be considered high or low, which makes interpretation somewhat difficult. However, we can assume that a score above 3 indicates that a respondent is more likely to agree with the statements in a certain subscale and a score below 3 that the respondent tends to disagree.

The data in Table 3 show that, broadly speaking, all participants largely agreed with items from the subscale "historical methodology", which indicates nuanced beliefs. Items related to naive beliefs were generally rejected. When looking in more detail, however, two groups emerge. The first group consists of respondents who assigned a very pronounced score to the nuanced and naive subscales. These respondents strongly agreed with the statements related to nuanced beliefs and strongly rejected statements related to naive beliefs. This is the case with the majority of respondents. In a second, smaller, group the difference was less pronounced. These respondents also agreed with the statements indicating nuanced beliefs, but at the same time gave an above-average score to the statements related to naive beliefs (e.g. respondents 4, 6, 11 and 19).

A second observation is that, although all respondents generally agreed with statements related to nuanced beliefs, some deviated from this pattern for one or more statements. Where this was the case, these statements were discussed in the interview in order to ascertain the reasoning underlying the teachers' responses. This generally revealed two things.

TABLE 3: Respondents' Mean Scores on Subscales Assessing Formal Epistemologies

	Naive epistemological beliefs		Nuanced epistemological beliefs (advanced)
Respondent	Nature of knowing (naive)	Nature of knowledge (objective)	Nature of knowing – nuanced/historical methodology
1.	1.25	1.40	6.00
2.	1.75	1.80	5.17
3.	2.25	1.60	4.17
4.	3.25	3.00	4.33
5.	2.00	2.60	5.33
6.	3.75	3.00	4.67
7.	1.75	2.20	5.83
8.	1.50	2.20	5.33
9.	3.00	2.40	4.67
10.	2.75	3.00	4.67
11.	3.50	3.00	4.00
12.	2.25	1.00	5.67
13.	2.50	2.20	5.00
14.	2.50	3.00	5.00
15.	1.50	1.20	5.83
16.	2.00	2.00	5.33
17.	2.00	1.80	5.33
18.	1.25	2.20	5.33
19.	3.75	3.20	4.83
20.	2.50	2.20	5.33
21.	2.00	1.80	4.83

First, the discussion revealed that some teachers merely wanted to nuance the statement, or had understood it differently. Teacher 12 indicated that he "agreed" with the statement "If eyewitnesses disagree, you cannot discover what actually happened", which was striking considering that his answers otherwise very unambiguously suggested nuanced beliefs. However, he explained his answer by referring to a specific topic in ancient history, where the source material is sometimes so limited that it is indeed difficult to find out what happened. This teacher subsequently spontaneously linked this to the need to study the credibility of the authors and to weigh up the arguments, and thus, to the disciplinary methods of historians.

Second, further discussion of certain statements suggested that teachers applied a "didactic frame" when answering the statements, and kept their students and teaching practice in mind. Teacher 2 explained why he "rather disagreed" with the statement "A good history account discusses different views of the past". He stated: "I see this from my work as a history teacher. If I make it too complicated, I lose them (the students) completely and then they remember nothing of it". As a history teacher he therefore saw it as his task to consider "what is the most probable at that point in time and then to present it clearly as a univocal, structured account". A similar mechanism was at play in the reasoning of teacher 6. She "rather agreed" with the statement "You can't write well about the past when sources contradict each other", but clarified in the discussion that she found it especially difficult to teach about the past when sources contradict each other. She pointed to the level of difficulty for her students and the limited teaching time, which makes it difficult to paint a nuanced picture of the past.

On a methodological level, these examples show that caution is needed when interpreting the results of these kinds of statements, as they seem to measure more than epistemological beliefs.

First, this is because, when considering these statements, teachers allow other beliefs about the teaching and learning of history, as well as contextual factors, to influence their answer. The finding that, on an academic level, teachers are aware of the constructed nature of historical knowledge, but in their teaching prefer to adhere to a univocal and factual historical account, connects to Maggioni and Parkinson's (2008) notion of a double epistemic standard. Second, caution is needed because it remains unclear precisely how teachers interpret such statements. Although some respondents disagreed with items related to nuanced beliefs, it became clear in the discussion that they did actually hold nuanced beliefs.

To obtain a more accurate picture, therefore, it is important to complement these results with those of the case study involving contrasting statements.

Practical epistemologies

Practical epistemologies were mapped using a case study with contrasting statements. Two theories were presented about the spread of agriculture ca. 6000 BC. Teachers were asked whether both theories could be correct and, if so, whether one could be more correct than the other.

Teachers answered the contrasting statements in two different ways. One teacher indicated that both theories were equally correct. This answer indicates naive beliefs. All the other respondents replied, in line with nuanced epistemological beliefs, that both statements could be correct, but one could be more correct than the other. Thus, based on these answers, almost all respondents seemed to have nuanced epistemological beliefs. However, the discussion of the answers to the case study generated more ambiguous results. Based on the argumentation put forward by the respondents, two categories were distinguished.

A first category consisted of respondents whose explanation confirmed the result of the contrasting statements. These respondents provided an argumentation for their response which clearly pointed to nuanced epistemological beliefs. They directly or indirectly mentioned the constructed and interpretive character of history, as they explained the existence of different theories by referring to differences in the source material which was available or was examined, differences in the interpretation of the source material or in the background or positionality of the researchers. Moreover, these teachers emphasized the importance of argumentation and evidence that could help determine which theory might be more or less plausible.

A second category consisted of teachers whose explanation somewhat questioned the result of the contrasting statements, either because of a lack of good argumentation, or because the argumentation leaned towards rather naive beliefs. Teacher 14, for instance, initially started by saying that "Both could be right; however, these are actually two opposite theories, so I think it is one or the other". Nevertheless, he concluded that both theories could still be right, by theorizing about ways in which both phenomena could occur alongside each other. Rather than explaining why one theory could be more correct than the other, this respondent tried to reconcile both theories and thus somewhat contradicted himself. A similar reasoning was expressed by teacher 2. Other respondents emphasized the importance of historical methodology so strongly that they appeared to lean towards procedural objectivism (Stoel et al., 2017). For example, teacher 4 stated that both theories can be correct "until it has been definitively researched"; teacher 20, who initially did refer to the positionality of historians, subsequently stated that one theory could be more correct because "one method may be better executed (…): more neutral, objective and scientific". Based on the explanations provided by these teachers, it is questionable whether they do actually hold nuanced epistemological beliefs.

Table 4 shows for each respondent whether the answer to the contrasting statements was in line with nuanced or naive beliefs and whether this was confirmed by the explanations they provided for their answers.

Table 4: Respondents' Answers and Discussion of the Case Study Measuring Practical Epistemologies

	Formal epistemologies			Practical epistemologies	
Respondent	Nature of knowing (naive)	Nature of knowledge (objective)	Nature of knowing – nuanced/historical methodology	Case-study: contrasting statements	Does the discussion of the case-study confirm the result of the contrasting statements?
1.	1.25	1.40	6.00	Nuanced	Yes
2.	1.75	1.80	5.17	Nuanced	No
3.	2.25	1.60	4.17	Nuanced	Yes
4.	3.25	3.00	4.33	Nuanced	No
5.	2.00	2.60	5.33	Nuanced	No
6.	3.75	3.00	4.67	Nuanced	No
7.	1.75	2.20	5.83	Nuanced	No
8.	1.50	2.20	5.33	Nuanced	Yes
9.	3.00	2.40	4.67	Naive	Yes
10.	2.75	3.00	4.67	Nuanced	Yes
11.	3.50	3.00	4.00	Nuanced	No
12.	2.25	1.00	5.67	Nuanced	Yes
13.	2.50	2.20	5.00	Nuanced	Yes
14.	2.50	3.00	5.00	Nuanced	No
15.	1.50	1.20	5.83	Nuanced	Yes
16.	2.00	2.00	5.33	Nuanced	Yes
17.	2.00	1.80	5.33	Nuanced	Yes
18.	1.25	2.20	5.33	Nuanced	Yes
19.	3.75	3.20	4.83	Nuanced	No
20.	2.50	2.20	5.33	Nuanced	No
21.	2.00	1.80	4.83	Nuanced	Yes

Table 4 shows that almost half the respondents gave answers to the contrasting statements that were in line with nuanced beliefs, but were unable to substantiate this properly. It seems as if teachers knew on a general, abstract level that history is based on interpretation, but found it difficult to apply this to a concrete case. This only emerged, however, when they were asked to explain their answers. If we compare these results to those of the formal epistemologies, it appears that teachers who have difficulty providing an adequate explanation for their answer are also those who, in addition to a high score on the nuanced subscale, assigned relatively high(er) scores to the other scales (e.g. teachers 19 and 11), although exceptions occur (e.g. teacher 2).

This again raises methodological questions, because, based on these results, it seems that the contrasting statements are insufficient to identify variations in epistemological beliefs. Moreover, it is unclear to what extent practical epistemologies are actually applied when answering the contrasting statements, as teachers' answers seemed to be based primarily on general beliefs about knowledge of the past. The practical epistemologies mainly appeared to come into play when they were explaining their answers.

Teachers' understanding of historical thinking

Introducing students to the practice of historians, and consequently to the interpretive and constructed character of history, is an essential part of various models of historical thinking. The question then arises as to what extent teachers themselves see this as a part of historical thinking, and spontaneously include it in their own descriptions of the concept. Table 5 shows for each respondent whether their description of historical thinking included a reference to epistemological reflection.

Teachers' own descriptions of historical thinking in the questionnaire and in the interviews show that epistemological reflection was spontaneously mentioned by a minority of the respondents. For example, teacher 4 described historical thinking as "making students aware that (...) historians reconstruct the past based on sources and that these sources give "an image" of the past". Although most teachers, especially at a formal level, seemed to have nuanced epistemological beliefs, these were not strongly reflected in their descriptions of historical thinking. When epistemological reflection was mentioned, this was usually done by teachers who seemed, based on the statements and the case study, to have nuanced beliefs. A pronounced presence of nuanced epistemological beliefs therefore seems to be consistent with a more complete understanding of historical thinking.

Aspects of historical thinking which were mentioned by the majority of respondents were: working with sources, certain historical modes of reasoning and contextualization. Hence, teachers do actually refer to various aspects of introducing students to the disciplinary methods and in that way involve epistemological reflection in their understanding of historical thinking, albeit in an implicit way.

In order to gain a better understanding of teachers' ideas about historical thinking, respondents were confronted with an existing model and conceptualization of historical thinking, which included epistemological reflection. Teachers indicated that they generally recognized and agreed with this description of historical thinking, even when it was much broader than their own descriptions. This suggests that they have a fairly tacit understanding of the concept. The question therefore arises as to whether this permeates their instructional practice and whether they address epistemological reflection in that practice.

TABLE 5: Epistemological Reflection in Teachers' Understanding of Historical Thinking

	Formal epistemologies			Practical epistemologies		Understanding of historical thinking
Respondent	Nature of knowing (naive)	Nature of knowledge (objective)	Nature of knowing – nuanced/historical methodology	Case-study: contrasting statements	Does the discussion of the case-study confirm the result of the contrasting statements?	Constructed and interpretive nature of history mentioned as part of historical thinking?
1.	1.25	1.40	6.00	Nuanced	Yes	Yes
2.	1.75	1.80	5.17	Nuanced	No	No
3.	2.25	1.60	4.17	Nuanced	Yes	Yes
4.	3.25	3.00	4.33	Nuanced	No	Yes
5.	2.00	2.60	5.33	Nuanced	No	No
6.	3.75	3.00	4.67	Nuanced	No	No
7.	1.75	2.20	5.83	Nuanced	No	No
8.	1.50	2.20	5.33	Nuanced	Yes	Yes
9.	3.00	2.40	4.67	Naive	Yes	No
10.	2.75	3.00	4.67	Nuanced	Yes	Yes
11.	3.50	3.00	4.00	Nuanced	No	No
12.	2.25	1.00	5.67	Nuanced	Yes	Yes
13.	2.50	2.20	5.00	Nuanced	Yes	No
14.	2.50	3.00	5.00	Nuanced	No	No
15.	1.50	1.20	5.83	Nuanced	Yes	Yes
16.	2.00	2.00	5.33	Nuanced	Yes	No
17.	2.00	1.80	5.33	Nuanced	Yes	Yes
18.	1.25	2.20	5.33	Nuanced	Yes	No
19.	3.75	3.20	4.83	Nuanced	No	No
20.	2.50	2.20	5.33	Nuanced	No	No
21.	2.00	1.80	4.83	Nuanced	Yes	Yes

RQ2: How are teachers' epistemological beliefs and understanding of historical thinking reflected in their teaching practice?

Teachers' instructional practice

When asked for concrete self-developed teaching materials regarding historical thinking, teachers mostly presented individual or group assignments for students. A few teachers provided the entire syllabus which they had designed themselves and students used throughout the year. The materials presented were mainly designed to enhance students' skills in source analysis, although some focused on other aspects such as multiperspectivity, or deconstructing historical representations.

When analyzing the material in terms of whether and how historical thinking, including epistemological reflection, was addressed, three types could be distinguished. This is depicted in Table 6, which shows for each respondent whether the material supported epistemological reflection (yes/no) and if so, whether it reflected more naive or nuanced beliefs.

In the first type, the material presented a univocal and closed account of the past, leaving no room for interpretation and paying no attention to the way in which historical representations are created. Sources were for instance used only in an illustrative way, to exemplify the presented historical narrative. This kind of material therefore does not foster students' historical thinking skills and could possibly promote rather naive epistemological beliefs among students.

A second type (labelled as "yes-rather naïve") did pay attention to the disciplinary methods of historians, but reflected rather naive beliefs. These materials were designed by teachers specifically in order to introduce students to disciplinary methods, yet they did not manage to present them in an accurate way. They contained a discrepancy between teachers' (reported) goals and the actual material. Some materials, for example, were aimed at critical source work and urged students to answer a historical question based on sources. The questions related to the sources, however, only asked about the content of those sources. Critical reasoning about the sources, for instance in terms of their trustworthiness and representativeness, was not taken into account. This could implicitly give students the idea that sources are a direct reflection of the past and that historical research is limited to merely collecting and summarizing information obtained from sources. The role of interpretation and construction by historians was omitted in this type of material.

Even source work in which attention was paid to the trustworthiness of sources sometimes implicitly reflected naive epistemological beliefs, as it was assessed without reference to a concrete research question. The extent to which a source is trustworthy does not however lie within the source itself, but depends on the historical question at hand. In this regard, teachers sometimes used a fixed set of questions that students had to answer mechanically for each source. In other cases, source analysis was reduced to identifying objective (described as "facts") and subjective (described as "opinions") elements in sources, whereby subjectivity was equated with untrustworthiness. Students were also asked to assess the extent to which a historical representation, for example in a movie, was consistent with historical reality. "Subjective" sources were then compared to the "objective" work of historians, without referring to evolving historians' representations or the existence of historiographical debates. Although this type of source work was attentive to the subjective nature of sources and the role of historians, it still reflected rather naive beliefs as it reduced historians' disciplinary methods to the identification of objective elements in sources.

Moreover, material in this category paid little attention to the role of evidence and argumentation. In an assignment on multiperspectivity, in which students were introduced to multiple perspectives on the Israeli-Palestinian conflict, no reflection was encouraged on the quality of the perspectives. The extent to which the perspectives were based on evidence, and whether the arguments were equally strong in both cases, was not assessed. The material emphasized the interpretive and subjective dimensions of historiography, but without

acknowledging the role of historical methodology which allows historians to weigh the quality of different claims against each other.

A third type of material (labelled as "yes-nuanced") did support nuanced epistemological beliefs among students, and explicitly discussed the disciplinary methods of historians, for instance by means of a high-quality critical source analysis through which students answered a historical question. Sources were provided with sufficient contextual information to allow students to make a substantiated and well-reasoned judgement about their trustworthiness in relation to the research question. Other material in this category introduced students to different views on a historical phenomenon and then, based on an assessment of the sources, asked them to make their own, substantiated claim regarding the topic. For example, teacher 12 presented an assignment in which students weighed the arguments of one historian regarding the responsibility of Christianity for the destruction of classical culture. Based on a critical examination of this historian's evidence, students were encouraged to construct their own argument. This type of material introduced students to interpretation in historiography and to the way in which historians construct historical representations, while at the same time familiarizing them with procedures and methods designed to weigh various claims against each other. This material hence contributed to the development of nuanced epistemological thinking.

TABLE 6: Epistemological Reflection in Teachers' Instructional Practice

	Formal epistemologies			Practical epistemologies		Understanding of historical thinking	Instructional practice
Respondent	Nature of knowing (naive)	Nature of knowledge (objective)	Nature of knowing – nuanced/historical methodology	Case-study: contrasting statements	Does the discussion of the case-study confirm the results of the contrasting statements?	Constructed and interpretive nature of history mentioned as part of historical thinking?	Does the instructional practice support epistemological reflection?
1.	1.25	1.40	6.00	Nuanced	Yes	Yes	Yes - nuanced
2.	1.75	1.80	5.17	Nuanced	No	No	Yes – rather naive
3.	2.25	1.60	4.17	Nuanced	Yes	Yes	Yes – rather naive
4.	3.25	3.00	4.33	Nuanced	No	Yes	Yes – rather naive
5.	2.00	2.60	5.33	Nuanced	No	No	No
6.	3.75	3.00	4.67	Nuanced	No	No	Yes – rather naive
7.	1.75	2.20	5.83	Nuanced	No	No	Yes – rather naive
8.	1.50	2.20	5.33	Nuanced	Yes	Yes	Yes - nuanced
9.	3.00	2.40	4.67	Naive	Yes	No	No
10.	2.75	3.00	4.67	Nuanced	Yes	Yes	Yes – rather naive
11.	3.50	3.00	4.00	Nuanced	No	No	Yes – rather naive
12.	2.25	1.00	5.67	Nuanced	Yes	Yes	Yes - nuanced
13.	2.50	2.20	5.00	Nuanced	Yes	No	Yes - nuanced
14.	2.50	3.00	5.00	Nuanced	No	No	No
15.	1.50	1.20	5.83	Nuanced	Yes	Yes	Yes – rather naive
16.	2.00	2.00	5.33	Nuanced	Yes	No	Yes – rather naive
17.	2.00	1.80	5.33	Nuanced	Yes	Yes	Yes - nuanced
18.	1.25	2.20	5.33	Nuanced	Yes	No	Yes – rather naive
19.	3.75	3.20	4.83	Nuanced	No	No	Yes – rather naive
20.	2.50	2.20	5.33	Nuanced	No	No	Yes – rather naive
21.	2.00	1.80	4.83	Nuanced	Yes	Yes	Yes - nuanced

The relationship between teachers' epistemological beliefs, understanding of historical thinking and instructional practice

Table 6 allows for an exploration of the manner in which respondents' epistemological beliefs and description of historical thinking relate to their instructional practice.

In a number of cases (e.g. 1, 8 and 12), a clear one-to-one relationship could be discerned between the teachers' epistemological beliefs and the way in which the teaching material presented history. They unambiguously espoused nuanced epistemological beliefs, both in the statements and the discussion of the case study. Moreover, they addressed epistemological

reflection in their own description of historical thinking and developed teaching materials which reflected nuanced epistemological beliefs. Conversely, teachers 6 and 9 held epistemological beliefs which could not unequivocally be qualified as nuanced. These teachers scored relatively high on the subscales related to naive and nuanced beliefs. Their results in the case study added to this ambiguity. This was also evident in their instructional practice, which either did not pay attention to epistemological reflection or leaned towards rather naive beliefs. However, for a large number of respondents, the relationship was not so straightforward. Some teachers (e.g. 15 and 18) did have nuanced epistemological beliefs, but did not transfer this into their instructional practice.

In general, it can be concluded from Table 6 that teachers who paid attention to the interpretive and constructed character of history in their instructional practice also held nuanced epistemological beliefs themselves. Conversely, having nuanced beliefs did not necessarily lead to an instructional practice that supported nuanced beliefs.

Two considerations are important in this regard. First, this finding indicates that other beliefs influence the relationship between epistemological beliefs and instructional practice. This was illustrated clearly in the case of teacher 12. Although he himself had nuanced beliefs and addressed this in his instructional practice, he spontaneously indicated that he only rarely did so. Within the amount of time available for history education, he preferred to prioritize other objectives in his teaching. Hence, both his beliefs about the purpose of history education and contextual factors had an influence. Second, methodological issues continue to play a role here. Both the Likert-type statements and the case study appear to be insufficiently capable of accurately capturing teachers' epistemological beliefs. Moreover, they do not always unequivocally point in the same direction.

Conclusion and discussion

This study sought to gain an insight into the relationship between teachers' formal and practical epistemologies, their understanding of historical thinking and their instructional practice. Using a questionnaire and interviews, 21 history teachers' epistemological beliefs on a general and practical level were analyzed, along with their understanding of historical thinking and their instructional practice. In so doing, we also sought to contribute to methodological debates about measuring epistemological beliefs.

Teachers' understanding of historical thinking, epistemological beliefs and instructional practice

As regards history teachers' epistemological beliefs, it is difficult to paint an unambiguous picture. Based on a combined analysis of their general and practical epistemologies, it was only possible to unambiguously identify nuanced or naive beliefs in about half the respondents. For the other half, nuanced beliefs seemed to be present only superficially. This was apparent from the absence of an accurate argumentation in the case study and in the combination of nuanced and naive beliefs. In some cases, this appeared to stem from a procedural objectivist stance (Stoel et al., 2017). For these teachers, naive and nuanced beliefs coexisted and they attached great importance to disciplinary procedures as a means of obtaining absolute knowledge about the past.

As regards teachers' understanding of historical thinking, it appears that most teachers were aware of history being a matter of interpretation and construction. Yet less than half of them spontaneously brought this up. The same applied to other dimensions of historical thinking, which suggests that teachers have only a cursory understanding of the concept. The absence of a clear operationalization of historical thinking in the Flemish history standards, can serve as an explanatory factor here.

This cursory understanding of historical thinking could also be observed in teachers' instructional practice. In the teaching materials we analyzed, teachers aimed to introduce

students to the disciplinary methods of historians, yet only a handful of teachers succeeded in developing materials that adequately reflected the interpretive and constructed nature of historical knowledge. The majority of teachers presented materials which reflected a rather naïve understanding of history by either over-emphasizing the subjective nature of historical knowledge or misrepresenting disciplinary methods. These superficial practices regarding historical thinking might be connected to teachers' rudimentary understanding of the concept, but might also be due to epistemological or other beliefs.

As to the relationship between epistemological beliefs and instructional practice, this study confirms the existence of a such a relationship (Van Hover & Yeager, 2004; Wansink et al., 2016; Yilmaz, 2008). More specifically, nuanced epistemological beliefs among teachers seem to be a necessary condition for a practice that includes interpretive history teaching, although they are not in themselves a sufficient condition. In line with the research by VanSledright (1996), Hartzler-Miller (2001), McDiarmid (1994) and Voet and De Wever (2016; 2019), this study found that teachers' nuanced epistemological beliefs were not always reflected in their instructional practice.

We propose three explanations for this. A first is that teachers sometimes held rather naive practical epistemologies, even though their general epistemologies were more nuanced. As we will argue later, teachers' practical epistemologies were more accurately captured in the discussion of the case study rather than via the contrasting statements themselves. For a number of teachers (e.g. teacher 2, 6, 7 and 11) these discussions revealed rather naive views, which could explain why their teaching materials did not fully support nuanced epistemological beliefs either.

For other teachers, this explanation does not suffice, as both their formal and practical epistemologies (based on the discussion) indicated nuanced beliefs, while their practice did not (e.g. teacher 3 and 10). A second explanation is therefore related to the situated nature of teachers' instructional practice. Several researchers have pointed out the importance of context when assessing epistemological beliefs, as specific conditions might generate different epistemic cognitions and aims (Chinn, Buckland, & Samarapungavan, 2011; Sandoval, 2014). It is for instance possible that a teacher's aim is not to introduce students to the interpretive nature of historical knowledge, but rather to transfer the 'existing' knowledge, because the teacher does not consider it feasible or desirable to translate their own nuanced epistemic beliefs into their teaching practice. This links to findings in other studies emphasizing the importance of contextual factors in teachers' instructional practice (e.g. Hicks, Doolittle, & Lee, 2004; VanSledright & Limón, 2006; Voet & De Wever, 2016).

Lastly, we should consider the possibility that teachers may encounter serious difficulties in designing materials that accurately reflect disciplinary methods and promote a nuanced epistemological understanding in students. Our analysis of the teaching materials showed that several teachers did try to introduce students to the methods of historians, but did not always succeed in developing materials that achieved this adequately. This might indicate that teachers' competence in designing such materials is not sufficiently developed. The fact that teachers cannot rely on a concrete conceptualization or didactic support from the history standards might exacerbate this difficulty.

These observations have implications for teacher training programs and professionalization initiatives. It is particularly important that these pay explicit attention to and support teachers in the development of teaching materials aimed at fostering epistemological reflection. Furthermore, a thorough understanding of the concept of historical thinking should be imparted, given teachers' limited and tacit understanding of the concept.

Methodological findings

On a methodological level, the combined analysis of teachers' formal and practical beliefs in this study revealed two difficulties. A first concerns the question of whether the measurement instruments are capable of accurately mapping teachers' epistemological beliefs. It appeared that the statements based on Stoel et al. (2017) were interpreted in various ways by teachers, and that

their answers were not always in line with their actual beliefs. Moreover, the instrument did not succeed in isolating teachers' epistemological beliefs: throughout the discussion of the statements, it became apparent that teachers considered them from a didactic perspective and took into account contextual factors when answering them. Teacher 2, for instance, saw it as his task to weigh up different perspectives on the past for himself, in order to subsequently present a univocal account to his students. The fact that teachers can have a double epistemic stance and thus have differing views on disciplinary and school knowledge has already been established (Maggioni & Parkinson, 2008), but the discussion of the statements shows that it is difficult to separate the two in teachers' minds and thoughts. This explains inconsistencies in answers and casts doubt on whether general statements are capable of generating a valid assessment of teachers' formal epistemological beliefs. This might also explain why scholars experience difficulties when using statements to capture these beliefs (e.g. Voet & De Wever, 2019).

The finding that teachers do not distinguish their own epistemological beliefs from the context of their teaching only became apparent after we discussed some of the statements with the respondents. We also applied this procedure to the instrument that assessed teachers' practical epistemologies. At first glance, this instrument seemed less sensitive in this regard, as we found no indication that teachers were including their beliefs about school knowledge and contextual factors in their response. However, the discussion of the contrasting statements uncovered a second methodological issue: the inconsistency between teachers' responses and their justification for them. It was only when responses were discussed that variations in teachers' epistemological beliefs emerged, sometimes revealing rather naive views. This suggests that the contrasting statements by themselves were insufficient to identify teachers' practical epistemologies. We suspect this to be the case because although the contrasting statements were connected to a concrete case, they might still primarily gauge formal epistemologies, since they are fairly generic and require little concrete application of epistemological beliefs. Only when teachers were asked to explain their answers did they start to reason about the specific case at hand, which seemingly activated practical epistemologies.

Methodological implications for future research

This study also provides suggestions for how to proceed in further research. First, this study highlighted the profound interconnectedness of teachers' epistemological beliefs with other beliefs and contextual factors. When trying to measure teachers' epistemological beliefs, researchers might therefore consider starting from the assumption that teachers will bring their didactic context into play, making it difficult to measure something as complex as epistemological views using general statements. Precisely because such statements fail to capture the mediating role of teaching contexts and other beliefs in the translation of teachers' beliefs into their practice, they appear to be poor predictors of that practice.

Second, rather than focusing on general epistemological beliefs, future research might benefit from concentrating more on teachers' practical epistemologies. When teachers were asked to reflect on an authentic discipline-specific case, differences in epistemological views emerged that remained hidden at a formal level and that appeared to correspond better with their teaching practice. However, more research is needed to develop a measurement instrument that can accurately capture these practical epistemologies, as the contrasting statements by themselves still seemed to primarily gauge formal epistemologies. An instrument that requires teachers to provide substantiated reasoning about a discipline-specific task would seem to be more suitable. The scenario-based Epistemic Thinking Assessment by Barzilai and Weinstock (2015), which combines a scenario-based approach for biology and history with Likert-type statements, might be interesting in this regard. Although the history-based scenario was less valid and reliable than the biology scenario, a further examination of this instrument in future research might constitute a valuable addition.

Third, this study showed that teachers' instructional practices revealed a variety of views on disciplinary knowledge. Some teachers presented history as a single, univocal narrative, while

others emphasized the subjective nature of historical knowledge or presented history as interpretive and constructed. Considering this variation, it might perhaps be fruitful for further qualitative research to work 'in reverse': rather than trying to understand teachers' practices via their beliefs, teachers' instructional practice might perhaps serve as a fruitful starting point for examining their epistemological beliefs and their understanding of historical thinking. It remains important, however, to simultaneously assess other beliefs and the role of contextual factors and related epistemic aims, so that their influence can be identified.

A final implication stems from the finding that a discrepancy sometimes occurs between teachers' intended objectives for their practice and the actual materials used. It therefore seems imperative that research on teachers' epistemological beliefs and practices does not rely solely on self-reported practices, but complements this with an analysis of actual teaching practices, for instance via lesson observations or an analysis of didactic materials.

Finally, two limitations should be mentioned. First, the sample consisted entirely of teachers from the last stage of secondary education. They all had a Master's degree, which can be expected to influence their epistemological beliefs (e.g. Voet & De Wever, 2019). Second, in most cases we only studied a fraction of teachers' instructional practice. Teachers were given the opportunity to make their own selection of 'best' materials, but how these materials relate to their teaching practice as a whole was not thoroughly examined.

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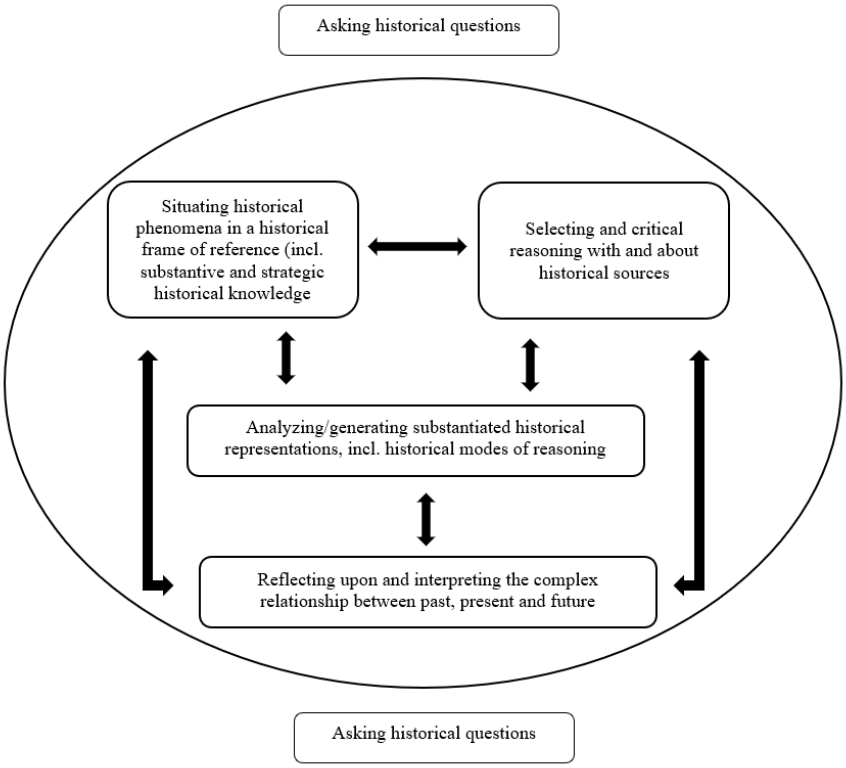
Appendix A: Conceptualization of historical thinking as used in this research

FIGURE A1: Conceptualization of Historical Thinking



Note: The conceptualization of historical thinking consists of five building blocks.

- Asking historical questions about the past, which constitutes a starting point for historical thinking.
- Situating historical phenomena, sources and representations in a broader historical frame of reference. This includes the acquisition of substantive and strategic historical knowledge.
- Selecting and critically analyzing historical sources, including reasoning with and about sources. This includes, among others, the ability to evaluate a source's usefulness, reliability, and representativeness in light of a specific historical question.
- Analyzing and/or formulating a substantiated answer to a historical question (i.e. constructing a historical representation). This building block includes the ability to deconstruct existing historical representations as well as to construct one. This is based on a critical source analysis and includes the application of typical historical modes of reasoning such as: cause and consequence (incl. contingency); continuity and change, historical contextualization, historical empathy, multiperspectivity, the attribution of agency, drawing historical analogies, deconstructing collective memory, deconstructing narratives and constructing open and substantiated narratives.
- Critically reflecting on and interpreting the complex relationship between past, present and future. This explicitly includes the need for epistemological reflection and requires students to understand the interpretive and constructed nature of historical knowledge and the importance of one's positionality.

Reference: Van Nieuwenhuyse (2020, pp. 373-379).

Appendix B: Overview of analytical concepts in relation to the data collection instruments

TABLE A1: Overview of Analytical Concepts in Relation to the Data Collection Instruments

Theoretical concepts	**Analytical categories (codes)**	**Data collection instruments**		
		Questionnaire	**1st semi-structured interview**	**2nd semi-structured interview**
Teachers' understanding of historical thinking *Which aspects of historical thinking do teachers mention in their own conceptualization?*	Among others: Historical questions Historical modes of reasoning _agency _multiperspectivity _causality _ … Epistemological reflection	Open-ended questions: - Teachers' own definition of historical thinking - Strategies to foster it among students	Discussion of answers to questionnaire Discussion of model of historical thinking	
Formal epistemology *What are teachers' general beliefs about the characteristics of knowledge and its justification in history?*	Formal EB _naive _nuanced	Likert-type statements (based on Stoel et al., 2017)	Discussion of inconsistencies within statements gauging formal epistemology	
Practical epistemology *What kind of epistemic reasoning and thinking do teachers display when confronted with a discipline-specific task?*	Practical EB _naive _nuanced		Case-study on a historiographical debate with contrasting statements and discussion	
Instructional practice regarding historical thinking *Which aspects of historical thinking are addressed? How are disciplinary practices and knowledge presented in teachers' instructional practice aimed at fostering historical thinking?*	Among others: Historical modes of reasoning _agency _multiperspectivity _causality _ … Source work _reasoning with _reasoning about _… Epistemological reflection _naive _nuanced			Analysis and discussion of concrete teaching materials regarding historical thinking, provided by respondent.