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Researching Epistemic Beliefs in History Education: A Review

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ABSTRACT

Departing from the pioneering work of VanSledright and Maggioni (2016), this article revisits questions about epistemic beliefs and the role these beliefs play in the teaching and learning of history. Eighteen recent studies on epistemic beliefs of history teachers (*n*=7) and students (*n*=11) are reviewed, guided by questions regarding conceptualization, relationships with other constructs (e.g., historical reasoning and teaching beliefs), expression of beliefs in teachers and students, differences in age and educational level, suggestions for pedagogical principles, and contextual factors that inhibit or support history teachers in "putting their beliefs into practice". Results reveal that epistemic beliefs are conceptualized based on developmental and dimensional frameworks, although most recent studies integrated developmental and dimensional approaches. Important findings regarding students and teachers are highlighted, resulting in implications for research and practice.

KEYWORDS

Epistemic beliefs, historical reasoning, history education, pedagogical principles, literature review

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Introduction

In 2019, biologists published a study on the relationship between the infamous "Habsburg jaw" and inbreeding. In the study, the researchers analyzed publicly available online portraits of members of the Habsburg dynasty and correlated facial deformities with the degree of relatedness (Vilas et al., 2019). Commenting on the research on Dutch radio, a historian observed that the biologists had treated the painted portraits as representative "photographs". However, she argued that paintings from the Habsburg royal family were not always truthful. In fact, Habsburg rulers were known to use their trademark jaw as propaganda or to serve as proof of their legitimacy. The historian also pointed out that the paintings can only be investigated within their historical context and that claims in (art-)history are always interpretative, although the discipline does provide researchers with specific investigative methods. In short, she concluded that works of art cannot simply be used as sources to draw "objective" evidence from, but must instead be studied according to domain-specific criteria, methods, and understandings.

This case exemplifies the ways in which epistemic activities differ across domains and how these differences impact the claims researchers make and the investigative processes they undertake. It has often been suggested that these activities and epistemic processes are guided by certain underlying epistemic ideas about a specific discipline.[1] For this reason, over the past twenty years educational research into history education has sought to conceptualize and assess these beliefs. However, because of the philosophical and often implicit nature of these beliefs, this has been a challenging task. A review study conducted by VanSledright and Maggioni (2016) showed that studies that measured epistemic beliefs in history education were still scarce and had yielded mostly tentative results. Moreover, their review raised questions regarding conceptualization and the predictive value of epistemic beliefs. Since their review, many new studies have been conducted on history students' and teachers' beliefs, based on different theoretical frameworks. In light of this upsurge in related research, in this article, we follow up on the review study of VanSledright and Maggioni (2016). Our aim is to provide an overview of the current state of research on epistemic beliefs in history education and to explore how different studies conceptualized these beliefs. In the discussion, we will reflect on the theorical and methodological questions that the review raised and suggest possible avenues for future research.

Background of the study

In 2016, VanSledright and Maggioni provided an overview of studies on epistemic beliefs in history education. In the first part of their review, authors showed that, prior to 2016, studies in history education had primarily focused on qualitative explorations of how students approached epistemic tasks in history, such as reasoning with discrepant accounts or interpretating contradictory sources (e.g., Lee & Shemilt, 2003; Tabak et al., 2010). In line with studies in other domains, this performance was often referred to as "epistemic cognition". In their review, VanSledright and Maggioni showed that this research had provided important insights into students' reasoning, and, from this, researchers had theorized about underlying (naïve and nuanced) epistemic beliefs. In the second part of the review, the authors discussed how historians and educational psychologists conceptualized epistemic beliefs (e.g., King & Kitchener, 2002; Kuhn & Weinstock, 2002; Lee & Shemilt, 2003) and focused specifically on the domain-specific framework of epistemic beliefs developed by Maggioni and colleagues, which combined and elaborated earlier frameworks. This framework is still of particular importance to the current review because it influenced many of the recent studies. Therefore, we will describe it here.

Maggioni's framework (Maggioni, 2010; Maggioni et al., 2004; Maggioni, et al., 2009) categorized epistemic beliefs according to three levels or "stances": (a) a copier stance, (b) a borrower stance, and (c) a criterialist stance. Each stance brought together a coherent set of

[1] In this review, we use the terms epistemic beliefs and epistemic ideas to refer to beliefs about (historical) knowledge. Several studies also use the term 'epistemological beliefs'.

beliefs about the certainty of historical knowledge, the role of the knower, and the sources of historical knowledge. For instance, a student or teacher with a copier stance would overemphasize objectivity and believe that the aim of history is to provide an objective "copy" of the past. In this stance, students or teachers would regard historical knowledge as fixed, historical sources as objective carriers of information (unless they are biased and useless), and historical methods as procedures for establishing "the truth" and writing the one "true story". In contrast, students or teachers with a borrower stance would regard history as "opinion". They understand the subjective nature of historical knowledge and historical sources. However, they would not (yet) understand the disciplinary criteria on which the validity of these claims could be based. As a consequence, these students tend to "borrow" from sources whatever fitted their argument. Finally, in the criterialist stance, a student or teacher would be able to "coordinate the objective and subjective dimensions of knowledge and knowing" (Kuhn & Weinstock, 2002, p. 310). They appreciate that historical knowledge is interpretative and temporary (questions are posed within a temporal and geographical context), and understand that historical sources are not subjective or objective as such, but can yield reliable evidence depending on the questions we ask. Disciplinary criteria (such as sourcing, corroboration, and contextualization) allow one to differentiate between valid and invalid interpretations.

In the third part of the review, VanSledright and Maggioni discussed outcomes of studies conducted with a questionnaire that was based on this framework: the "Beliefs about History Questionnaire" (BHQ) (Maggioni, 2010). Studies that had used the BHQ with (prospective) history teachers and students, had found that it was difficult to classify students or teachers within a specific epistemic stance (e.g., Maggioni, 2010; Maggioni et al., 2010; VanSledright & Reddy, 2014). Participants in the studies often reported agreement (or disagreement) with contradictory epistemic ideas. Several studies had focused on developing teachers' and students' understanding of the interpretative nature of history through professional development or inquiry tasks. These studies found that these learning environments indeed stimulated changes in beliefs, although these changes were often idiosyncratic: a phenomenon that the authors called "epistemic wobbling". Qualitative interviews showed that this "wobbling" was caused by difficulties in coordinating subjective and objective aspects of history (VanSledright & Maggioni, 2016, p. 140). This raised the question of whether these ideas about the nature of historical knowledge and knowing might be too abstract, tentative, and implicit, especially with younger students, to be assessed through quantitative methods. Furthermore, Van Sledright and Maggioni pointed to the fact that studies had not yet explored the relationships between epistemic beliefs on the one side, and epistemic performance and historical reasoning on the other (2016, p. 143). Thus, the question remained, as Mierwald et al. (2016) asked in the title of a conference paper: "Do they affect it at all?"

Research goal and research questions

As discussed above, VanSledright and Maggioni found that most studies prior to 2016 had focused on epistemic cognition from which underlying beliefs were inferred. The studies of Maggioni and colleagues were the first to define and quantitatively assess epistemic beliefs in history, and explore how these ideas impacted learning and understanding in history. However, questions remained about the feasibility of evaluating abstract epistemic beliefs and about the relationships between these beliefs and task performance. Furthermore, more knowledge was needed about effective pedagogies to foster nuanced epistemic beliefs. Since 2016, many new studies have been conducted that shed light on these conceptual, methodological, and theoretical questions. In the current article we discuss research on epistemic beliefs in history since 2016 and investigate the following four questions:

1. How have different studies conceptualized and operationalized epistemic beliefs among students and (prospective) history teachers, and what are the differences and similarities between these approaches?

2. What relationships do studies find between epistemic beliefs in history of students and teachers and other constructs (e.g., other domains and topics, historical reasoning ability, beliefs about teaching and learning)?
3. Which epistemic beliefs of participants were reported in the studies and how are they related to participants' age or educational background?
4. Which pedagogical principles do studies identify as fostering nuanced epistemic beliefs on history?

Method

Reviewed studies were selected using four criteria. First, because the study departed from the review conducted by VanSledright and Maggioni (2016), we limited our search to studies published between 2015 and (the end of) 2020. Second, we focused on studies that *conceptualized* and *measured* epistemic beliefs in *history* among students or teachers. Third, we included studies written in English, as well as in German. Finally, the search was limited to peer-reviewed publications; if an author had not published an English article, we referred to the accepted (peer-reviewed) PhD thesis.

Within these limitations, a search was conducted through two methods: a non-systematic (*snowballing* and *citation search*) review and a systematic search [ERIC and PsycInfo-database; March 8, 2021]. The search was divided into four categories: epistemic beliefs, history (education), research methodology, and educational context. Examples of keywords were *epistemology/ or historiography/ or historical interpretation/ or epistemolog*.ti,ab.* and *history/ or history instruction/ or (history or historical or historian*).ti,ab*. Our resulting sample consisted of 22 studies. In consultation between the three authors, four studies were rejected that (a) did not conceptualize epistemic ideas, or (b) used a completely different paradigm (e.g., equating epistemic beliefs of teachers with beliefs on learning and teaching). In our final sample, 18 studies were included: 11 studies focused on students' (primary education to university) epistemic beliefs and 7 studies focused on history teachers' epistemic beliefs.

Based on the formulated questions, the first author summarized the studies and constructed a table (Table 1), providing an overview of the analysis. Differences in classification were discussed between the three authors in regular meetings until consensus was reached. The analysis focused on: (a) conceptualization, (b) operationalization and assessment, (c) participants, (d) main findings, and (e) implications for practice.

Results

Conceptualizing epistemic beliefs in history

The reviewed studies conceptualized epistemic beliefs in different ways, although two main frameworks could be discerned: (a) a "developmental" framework—of which the aforementioned framework of Maggioni and colleagues is a prominent example—and (b) a "dimensional" framework, in which researchers define "types" of ideas (or dimensions) that underlie epistemic thinking in history (e.g., ideas about "certainty of knowledge", "justification of knowledge", or "source integration"). Table 2 shows the different dimensions that studies defined. However, as will be shown, these frameworks did not function as two separate paradigms, and in practice many studies combined developmental and dimensional aspects in their conceptualization, as well as in their analysis. In this section, we compare and contrast how studies conceptualized epistemic beliefs

TABLE 1. Overview of studies investigating epistemic beliefs since 2015

Studies	**Participants**				**Approaches**		**Method**		**Instrument**
	Students		Teachers		*Dev.*	*Dim.*	*Qual.*	*Quant.*	
	Ed. level	*N*	*Ed. Level*	*N*					
Namamba & Rao (2016)			Sec/E	132	✓			✓	BHQ
Voet & de Wever (2016)			Sec/E	22	✓		✓		Inferred
Wansink, Akkerman, & Wubbels (2016)			Sec/P	13		(✓)	✓		Inferred
Wansink, Akkerman, Vermunt, Haenen, & Wubbels (2017)			Sec/P	48		(✓)	✓		Inferred
Nitsche (2019)			Sec/P	177	✓	✓	✓	✓	Other
Sakki & Pirttilä-Backman (2019)			Sec/E	633		(✓)		✓	Other
Miguel-Revilla, Carril-Merino, & Sánchez-Agustí (2020)			Pri/P & Sec/P	430	✓			✓	BHQ
Barzilai & Weinstock (2015)	Uni	481			✓	✓		✓	ETA
Stoel, Logtenberg, Wansink, Huijgen, Van Drie, & Van Boxtel (2017)	11th PU/HG	95				✓		✓	Other
Stoel, Van Drie, & Van Boxtel (2017)	11th PU	922			✓			✓	BHQ
Thomm, Barzilai, & Bromme (2017)	Uni	184			✓	✓		✓	ETA
Iordanou, Muis, & Kendeou (2019)	6th–8th	47			✓			✓	Livian
	Uni	24							
Mierwald (2020)	11th–12th PU	161	Sec/P	224	✓			✓	BHQ
Barzilai, Thomm, & Shlomi-Elooz (2020)	Uni	104 & 113			✓	✓		✓	ETA
Iordanou, Kendeou, & Zembylas (2020)	Uni	39			✓			✓	Livian
Wiley, Griffin, Steffens, & Britt (2020)	Uni	553 & 151				✓		✓	Other
	6th–8th	345							
	10th–11th	130							
Ioannou & Iordanou (2020))	7th	79			✓		✓	✓	Livian
Barzilai, Mor-Hagani, Zohar, Shlomi-Elooz, & Ben-Yishai (2020)	9th	88						✓	Other

Notes:

✓ = main operationalization
(✓)= operationalization implicit
✓ = developmental framework with underlying dimensions defined (Table 2)

Students: Uni = university, PU = pre-university, HG = higher general education.
Teachers: Pri = primary, Sec = secondary teachers; E = experienced, P = prospective.

Grades are counted from 1 to 12 following the US-system: grade 1 students are 6-7 years old, …, grade 12 students are 17-18 years old.
Students with university students range between M_{age}=22 years old and M_{age}=28 years old.

Instruments: *BHQ* = Beliefs about History Questionnaire (Maggioni, 2010); *ETA* = Epistemic Thinking Assessment (Barzilai and Weinstock, 2015);
Livian = original assessment based on Livian War (Kuhn et al., 2008)

TABLE 2: Dimensions of Epistemic Beliefs

Dimensions	**Barzilai and Weinstock (2015)**	**Nitsche (2019)**	**Stoel, Logtenberg et al. (2017)**	**Wiley et al. (2020)**
Nature of knowledge - *truth is attainable* - *knowledge is certain / uncertain* - *one right account / multiple accounts or perspectives*	- right answer - certainty of knowledge - attainability of truth	- structure of knowledge - certainty of knowledge - application of knowledge	- nature of knowledge–objective	- simplicity / certainty
Sources of knowledge - *in/outside the self* - *right or wrong facts / interpretation (theory - data coordination)*	- source of knowledge - reliable explanation - nature of knowledge	- concept of history - origin of knowledge - justification for knowing	- nature of knowing–naïve (objective)	- integration
Methods (critical thinking) - *focus on criteria for evaluating accounts (e.g., sourcing)*	- evaluate explanations - judge accounts		- nature of knowing–nuanced (criteria)	

Note: the studies of Barzilai and Weinstock (2015) and Nitsche (2019) develop items connected to the objectivist, subjectivist and criterialist perspective for each dimension they define. The results are primarily analyzed on the level of perspectives. The studies of Stoel, Logtenberg et al. (2017) and Wiley et al. (2020) operationalize three or two scales. Results are primarily analyzed on the level of dimensions.

As Table 1 shows, most recent studies in history education departed from a developmental framework, building on the domain-general models of King and Kitchener (2002) and Kuhn et al. (2000). Several studies in this review adopted the "stances" framework of Maggioni and colleagues, and differentiated between a "copier", a "borrower" and a "criterialist" stance (Mierwald, 2020; Miguel-Revilla et al., 2020; Namamba & Rao, 2016; Stoel, Van Drie, & Van Boxtel, 2017; Voet & De Wever, 2016). Other studies were based on a model of Barzilai and Weinstock (2015) that differentiates between an "absolutist", a "multiplist" and an "evaluativist" perspective (Barzilai, Thomm, & Shlomi-Elooz, 2020; Thomm et al., 2017). Based on this model, Barzilai and Weinstock designed the "Epistemic Thinking Assessment" (ETA). A differentiation between "absolutist", "multiplist", and "evaluativist" perspectives also underpinned the conceptualization of Iordanou and colleagues (Ioannou & Iordanou, 2020; Iordanou et al., 2019; Iordanou et al., 2020). Although these models use different words to describe coherent "sets" of epistemic ideas, the three "levels" defined are comparable.[2]

Table 1 also shows two studies that departed from a dimensional framework (Stoel, Logtenberg et al., 2017; Wiley et al., 2020). This framework can be traced back to the domain-general work of Schommer (1990). Instead of conceptualizing coherent levels, these studies defined underlying dimensions of epistemic thinking. A dimensional framework provides flexibility in the amount and type of dimensions distinguished (see Table 2 below). For instance, Stoel, Logtenberg et al. (2017) defined two dimensions connected to the objective nature of historical knowledge and the sources of knowledge, and one dimension connected to disciplinary criteria and inquiry. Wiley et al. (2020) defined one scale connected to the certainty and simplicity of causal explanations in history and one scale connected to the importance of integrating information from multiple sources. While developmental research assumes that epistemic development occurs in stages and aims to determine which perspective a learner predominantly holds, dimensional studies emphasize that these beliefs develop at different speeds on different dimensions, and that learners might increase their understanding in one dimension, while—temporarily—relapsing on another.

Although the studies in this review departed from various frameworks, many of them integrated dimensional and developmental approaches. For instance, Barzilai and Weinstock (2015) conceptualized epistemic perspectives (e.g., "absolutist", "multiplist", or "evaluativist") based on multiple underlying dimensions of epistemic thinking (see Table 2 below). In the ETA, multiple statements for each dimension were constructed that could be connected to the absolutist, multiplist, or evaluativist perspective. Nitsche (2019) used a similar combination of a developmental and a dimensional approach. His study conceptualized underlying dimensions in relation to Maggioni's stances. In their conclusion, Stoel, Logtenberg et al. (2017) interpreted students' scores on the three epistemic dimensions against a developmental background. They argued that agreement with the scales on objectivity might reflect an objectivist perspective, whereas a strong rejection of these scales might indicate more subjectivist ideas. In addition, a strong agreement with disciplinary criteria for inquiry in combination with a moderate rejection of objectivity might represent a criterialist perspective.

Barzilai and colleagues (2015, 2017, 2020) and Iordanou and colleagues (2019, 2020) contributed to the approaches for measuring epistemic beliefs by departing from the premise that epistemic ideas are often implicit and tentative in nature. Consequently, they stressed the importance of using a concrete (historical) context to elicit epistemic reflection, or what Barzilai and Weinstock call "theory-in-action" (2015, p. 142). These studies utilized a small task in which two conflicting accounts of a fictional war were presented to students ("the Livia problem") (Kuhn & Weinstock, 2002). Barzilai and colleagues used this task as a point of reflection before collecting responses on the ETA. Using a similar framework, Iordanou and colleagues asked participants two Yes/No-questions in response to the conflicting accounts: (1) "Can one historian be more right

[2] Note on terminology for studies based on a developmental framework: this review uses the terms "objectivist", "subjectivist", and "criterialist" when discussing epistemic perspectives (or stances) in general. When specific studies are discussed, the terms of those studies are used: (a) copier / absolutist (objectivist), (b) borrower / multiplist (subjectivist), (c) criterialist / evaluativist (criterialist).

than the other?" and (2) "Could anyone ever be certain about what happened in the Fifth Livia War?" Based on their answers and subsequent elaborations, students were classified as absolutist (a "Yes" on both questions); multiplist (a "No" on both questions); or evaluativist (a "Yes" on the first question and a "No" on the second question).

An interesting finding of this review is that almost all quantitative studies that used a developmental framework did not classify students or teachers within a specific epistemic perspective. Instead, these studies analyzed results in a more relative manner, presenting mean scores on the three epistemic positions and exploring differences between groups or between pre- and post-tests (e.g., Barzilai & Weinstock, 2015; Barzilai, Thomm, & Shlomi-Elooz, 2020; Thomm et al., 2017; Miguel-Revilla et al., 2021; Mierwald, 2020; Namamba & Rao, 2016; Nitsche, 2019; Stoel, Van Drie, & Van Boxtel, 2017). Only the study of Voet and De Wever (2016) and the studies of Iordanou and colleagues categorized teachers and students within one epistemic stance. However, in Voet and De Wever's (2016) study this classification was based on the analysis of qualitative data (interviews), meaning that beliefs were inferred from teachers' statements, while in Iordanou and colleagues' research the classification was partly based on the qualitative arguments students provided for their choices.

The role of epistemic beliefs in teaching and learning history: Empirical findings with students

In this section, we discuss results from eleven studies conducted with history students (see Table 1). In line with our research questions. We explore findings related to the domain-specificity of epistemic beliefs, relationships found with historical reasoning, expression of epistemic beliefs, development over time and educational level, and pedagogical approaches that might foster epistemic ideas.

Epistemic beliefs, domain-general, domain-specific, or topic-specific?

Research on epistemic cognition has indicated that students' epistemic performance differs across disciplines and even across topics within a discipline (Muis et al., 2006). However, it is unclear to what extent this also applies to students' underlying epistemic beliefs. Two studies conducted by Barzilai and colleagues provided empirical support for the idea that epistemic beliefs may have domain-general aspects, but that they "emerge in multidimensional forms when people engage in specific knowledge claims and information sources" (Barzilai & Weinstock, 2015, p. 142). Researchers presented 573 students (M_{age}=28 years) from multiple Israeli universities with two conflicting-account tasks (in biology and in history) and administered the ETA. Factor analysis showed that not only the values attributed to the three perspectives, but also the underlying structure of the questionnaire, differed between the two disciplines. In history, students endorsed multiplism significantly more and absolutism significantly less compared to biology. Furthermore, in the history scenario multiplist items that focused on the "sources of knowledge" were separated from items that focused on the "certainty of knowledge", whereas in biology these dimensions constituted one factor. In another study, Thomm et al. (2017) found that students (M_{age}=27 years) tended to explain account differences in history by focusing on "researcher's personal motivations" (e.g., worldviews and political interests), whereas in biology the focus was more on differences in research procedures and researchers' specializations. From these studies, it was concluded that students perceived historical knowledge as more subjective and open to interpretation than biological knowledge. In line with these findings, a study of Iordanou et al. (2019) concluded that students were also more inclined to make statements related to the credibility of evidence in history than they were in science. In a study with 61 young adults divided over two age groups (M_{age}=12-14 years, n=47 and M_{age}=22 years, n=24) researchers found that students engaged in more high-level epistemic processing when reasoning about conflicting accounts in history.

The above findings support the conclusion that students' agreement with specific epistemic ideas differs across domains. A subsequent question might be how topic-sensitive these beliefs

are within domains? The impact of topic knowledge has been studied specifically in relation to "sensitive topics", in which students might favor one account over another. For instance, a study with 104 university students in Israel (M_{age}=25 years) (Barzilai, Thomm, & Shlomi-Elooz, 2020) found that students evaluated the reliability of claims and the trustworthiness of sources in a fictitious history scenario with two conflicting accounts (Livian War) differently to how they evaluated the "real" historical scenario it was based on (Yom Kippur). In the Yom Kippur scenario, students judged the so-called "my-side account" (written from a perspective that agrees with students' prior knowledge) to be significantly more reliable and trustworthy, whereas in the Livian War scenario no differences in judgment of both accounts were found. However, topic familiarity did not influence students' underlying epistemic perspectives.

In conclusion, the above-described studies suggest that although the expression of epistemic beliefs differs between disciplines (e.g., history and biology), these beliefs are not directly influenced by topic knowledge.

Relationship between epistemic beliefs and historical reasoning

Several studies theorized about the relationship between epistemic beliefs and metacognition—they suggested that these beliefs influence the quality of students' historical reasoning and the strategies they deploy (e.g., Barzilai & Weinstock, 2015). An important hypothesis in several reviewed studies was that more nuanced epistemic beliefs lead to more thorough epistemic processing of reasoning tasks. In a think-aloud study with 39 Greek-Cypriot young adults (M_{age}=24 years), Iordanou, Kendeou, and Zembylas (2020) found that epistemic perspectives affected the way students processed a "my-side" and an "other-side" account of the war between Greek- and Turkish-Cypriot (1974). Evaluativist students (n=9) engaged in more epistemic processing than other students, but only when reading the "other-side" account. However, this processing was of limited quality and no criteria were formulated ("I disagree with this"). In line with Barzilai, Thomm, and Shlomi-Elooz (2020) prior knowledge appeared to mediate this processing; that is, accounts that were consistent with prior knowledge and beliefs were processed more superficially. Iordanou et al. (2020) also found that students with an evaluativist perspective more often included both accounts in their summaries, whereas absolutist and multiplist students only included the my-side account. These findings were corroborated by another study (Iordanou et al., 2019), in which it was shown that students with an evaluativist perspective produced more epistemic judgments about the credibility of evidence. However, in this study it was also found that the quality and quantity of these judgments were low, and students were predominantly categorized as absolutists. Meanwhile, a study with primary students (M_{age}=12 years) by Ioannou and Iordanou (2020) found that an evaluativist perspective was positively related to self-efficacy, self-regulation, and use of cognitive strategies in the MSLQ-questionnaire (Pintrich & De Groot, 1990). Furthermore, this study found that students with an evaluativist perspective engaged in more deep-level learning strategies when reading two conflicting accounts and scored higher on text comprehension. To conclude, these studies all indicated that epistemic beliefs (more specifically an evaluativist perspective) influenced the epistemic processes and learning outcomes of students.

In addition, the dimensional study of Wiley et al. (2020) focused on the relationship between epistemic beliefs and learning outcomes. In their study with 151 Advanced Placement (AP) and non-AP college students (M_{age}=18-20 years), students wrote an explanatory essay based on multiple sources, and were administered an epistemic questionnaire. The questionnaire was tailored towards causal reasoning and assessed (a) beliefs about simplicity/certainty of causal explanations and (b) beliefs about the value of integrating information across sources. Researchers theorized that epistemic beliefs would influence students' task- and activity-model, and therewith the quality of students' essays. After correcting the outcomes for general ability scores, the authors concluded that both epistemic belief-scales uniquely predicted the number of causes and contextual factors used in the essays. The integration scale also predicted explicit comparison between sources. Researchers concluded that epistemic beliefs indeed impacted cognition and learning outcomes through the task- and activity-model that students built.

Furthermore, the study provided support for the idea that epistemic beliefs can be fostered by education (i.e., AP-students had more experience with inquiry in history and scored higher on epistemic beliefs even after correcting for general ability). Finally, the study suggested that defining epistemic beliefs in line with specific aspects of historical reasoning (such as causality) might be a fruitful development, because it aligns epistemic beliefs with the reasoning goals embedded in the task.

Relationship between epistemic beliefs and students' interest in history

Four studies related epistemic beliefs to students' interest in history. The studies of Stoel, Van Drie, and Van Boxtel (2017) and Mierwald (2020), both carried out with pre-university students (M_{age}=17 years in both studies), found a positive correlation between the agreement with items belonging to the *criterialist* stance and individual interest in history (Pearson's r=.39 and .31 respectively). Stoel, Logtenberg et al. (2017), in their study with 922 11th and 12th grade exam students (M_{age}=17 and 18 years), reported a similar positive relationship between the value attributed to *methodological criteria* and interest. Furthermore, in Stoel, Van Drie, and Van Boxtel's (2017) study, the correlation between interest and criterialist ideas even increased (Pearson's r=.66) after a lesson unit that focused (among other things) on epistemic reflection. This finding suggested that addressing epistemic questions in the classroom might foster interest. Finally, Ioannou and Iordanou (2020) found a positive relationship between an evaluativist perspective and the value attributed to the "intrinsic value"-scale in the *MSLQ* (Pintrich & De Groot, 1990). In line with the previous section, correlations between interest and beliefs are only found with the more nuanced (evaluativist / criterialist) epistemic beliefs.

Epistemic beliefs: what ideas do students hold and how do these ideas develop?

In order to compare the results of different studies, we standardized the outcomes of each study (Table 3 below). To do so, we categorized the scales according to the three epistemic perspectives (objectivist, subjectivist, and criterialist). For the sake of comparison, the two objective dimensions of Stoel, Logtenberg et al. (2017) and the simplicity/certainty dimension of Wiley et al. (2020) were categorized under the objectivist perspective. This was done in line with theoretical underpinnings of these dimensions that include statements regarding historical knowledge as fixed, and historical sources as objective copies of the past. The dimensions of "methodological criteria" (Stoel, Logtenberg et al., 2017) and "integration" (Wiley et al., 2020) were categorized under the criterialist perspective, again in line with theoretical underpinnings of these dimensions that focus on the value attributed to disciplinary inquiry and integrating information from multiple sources. Subsequently, we converted the outcomes of different studies into proportions by dividing the means and standard deviations with the length of the scales they were measured with (ranging from 4 to 10).

As Table 3 shows, all studies found that students valued criterialist ideas, with scores ranging between 0.61 and 0.82. The ETA yielded a somewhat lower score on this perspective than the BHQ and the "dimensional" studies. Furthermore, studies found that students moderately agreed with ideas about objectivity (e.g., Mierwald, 2020; Stoel, Logtenberg et al., 2017), with scores ranging between 0.57 and 0.70 in the studies conducted with the BHQ and the ETA, as well as in the study of Stoel, Logtenberg et al. (2017). Finally, all studies that included a subjectivist perspective found that this perspective yielded the lowest scores (ranging between 0.38 and 0.53).

Meanwhile, studies that used the Livian War scenario consistently concluded that the absolutist perspective was valued higher than the evaluativist perspective (Barzilai & Weinstock, 2015; Barzilai, Thomm, & Shlomi-Elooz, 2020, Thomm et al., 2017; Ioannou & Iordanou, 2016; Iordanou et al., 2019, 2020). Consequently, the studies of Iordanou and colleagues that classified students within one perspective found a large proportion of absolutists (ranging from 56% to 69%). In contrast, studies conducted with the BHQ found the highest mean scores on the criterialist stance.

Theory suggests that epistemic beliefs develop over time and differ between educational levels. However, only a few studies with students have compared different age groups, or students from different educational levels. What is more, studies with the ETA were only conducted with university students, whereas studies with the BHQ were conducted with 11th grade pre-university students (in the Netherlands and Germany). Consequently, no clear conclusions can be drawn on this question and therefore more research is needed. The study of Stoel, Logtenberg et al. (2017) found that 11th grade pre-university students were significantly more critical towards objectivism and valued methodological criteria significantly higher than 10th grade students enrolled in higher general education, although the differences were small and may also be related to general ability or extended courses in history. The study of Iordanou et al. (2019) showed that age was related to making high-level epistemic statements about the relationship between claims and evidence. However, this study failed to identify a relationship between age and epistemic perspectives. Wiley et al. (2020) found a significant age-related difference between middle school students and high school students on both epistemic belief scales (simplicity/certainty and integration); but no clear differences were found between high school students and university students. In a sub-study with 345 middle school students (11 to 14 years) and 130 AP and Non-AP high school students (15 to 17 years) the researchers found that epistemic beliefs only predicted results on the document-based question for high school students and not for middle school students. Wiley et al. (2020) suggested that assessing epistemic beliefs with the youngest age groups may be problematic, because these ideas might not have been formed and might be considered pre-epistemic. Therefore, it may be difficult to draw a comparison between (pre-epistemic) beliefs of middle school students and more pronounced (naïve or nuanced) ideas of high-school students.

Fostering epistemic beliefs: pedagogical principles

Several studies indicated the importance of explicitly addressing epistemic questions in the history classroom. For instance, Wiley et al. (2020) highlighted the predictive value of epistemic beliefs except among young students, which suggested a learning trajectory from pre-epistemic towards more explicit levels of epistemic ideas (naïve or nuanced). The difference found between AP and Non-AP students, even when correcting for general ability (ACT-scores), supported the idea that epistemic ideas are fostered by education. Indeed, in AP-programs, students engage more frequently in historical inquiry and more often work with multiple sources. In another study, Stoel, Van Drie, and Van Boxtel (2017) found that explicit attention to epistemic ideas in the context of a causal historical inquiry task, led to higher scores on both the subjectivist and criterialist items of the BHQ. Results on the subjectivist items were not in line with theoretical expectations. However, authors suggested that the development towards subjectivism, combined with a stronger agreement of criterialist items, might also indicate a development towards regarding history more as interpretation. Furthermore, a quarter of the students in this study also reported a learning gain related to epistemic ideas.

In their study on prior knowledge and epistemic judgment, Barzilai, Thomm, and Shlomi-Elooz (2020) found that providing students with a "disagreement explanation"—a scaffold listing reasons for conflicting accounts in history—resulted in significantly higher agreement with items related to evaluativism. In another study, Barzilai, Mor-Hagani et al. (2020) concluded that learning with epistemic scaffolds (i.e., highlighting, collecting claims in boxes, visualizing, and linking claims together) led to significant gains in students' evaluation and integration performance in comparison with the control group. Moreover, students in the experimental group also reported higher knowledge of epistemic criteria (e.g., justification, trustworthiness) and strategies (e.g., sourcing, corroborating). Finally, in a quasi-experimental study with 161 11th- and 12th-grade German history students, Mierwald and colleagues (Mierwald, 2020; Mierwald, et al., 2022) explored how working with different types of sources (primary vs. audiotaped vs. textbook) influenced students' epistemic beliefs and historical argumentation. This study identified significant changes on the criterialist scales for students working with multiple primary or audiotaped sources, but not for students in the textbook condition.

The role of epistemic beliefs in teaching and learning history: Empirical findings with teachers

In this section, we discuss seven studies that focused on the epistemic beliefs of history teachers. A growing body of research in recent years has underscored the importance of teacher beliefs as a source of pedagogical decision-making. Teacher beliefs have multiple dimensions, but epistemic ideas about knowledge and knowing are often theorized as one of these dimensions (e.g., Buehl & Beck, 2015). We therefore, now turn our attention to the relationships studies found between epistemic beliefs on the one hand, and instructional preferences and learning goals of history teachers on the other. Subsequently, we explore what studies found regarding the expression of epistemic ideas in history teachers, and the relationships between epistemic beliefs and teachers' educational or cultural background. Finally, we focus on contextual factors that influence the ability of history teachers to translate their beliefs into effective classroom approaches.

Epistemic beliefs and beliefs about teaching and learning history

The relationship between epistemic beliefs of history teachers on the one hand, and their educational goals and pedagogical preferences on the other hand, was a central issue in several studies (e.g., Namamba & Rao, 2016; Nitsche, 2019; Sakki & Pirttilä-Backman, 2019; Voet & De Wever, 2016; Wansink et al., 2017). The learning goals and learning environments designed by history teachers are important because they are expected to influence students' epistemic beliefs (e.g., VanSledright, 2014). History teaching can support goals connected to critical reasoning, as well as goals connected to the formation of (national-) identities (e.g., Carretero, 2011; Wansink et al., 2016). A student-centered and constructivist approach is often expected to be conducive towards "critical reasoning" goals, whereas "national identity" goals are often connected to a more transmissive and reproductive approach to learning and teaching.

In a study with 132 secondary history teachers in Tanzania, Namamba and Rao (2016) used the *BHQ* to assess epistemic beliefs and explored relationships with self-reported teaching approaches. Their study found that criterialist beliefs positively predicted student-centered approaches, whereas teacher-centered approaches were predicted by copier and subjectivist beliefs. In contrast, in his questionnaire study with 177 prospective Swiss history teachers, Nitsche (2019) found no clear relationships between epistemic beliefs and teacher- or student-centered beliefs about learning and teaching. Nitsche suggested that the focus on pre-service teachers might explain this finding. However, in a qualitative case study in which two experienced history teachers reflected on video-taped observations regarding their classroom practices, he also concluded that contextual aspects and non-epistemic teacher beliefs (e.g., regarding students) played a prominent role in actual teaching practices and might have mediated or prevented the transfer of epistemic beliefs into practice. In addition, in a study that focused on the epistemic beliefs of 22 experienced history teachers and their ideas about inquiry-based teaching practices, Voet and De Wever (2016) found a relationship between epistemic beliefs and their reported teaching practice. In this study, 17 teachers were categorized as criterialist. Within this group, four teachers defined inquiry as "investigation" (i.e., asking questions, analyzing information, constructing arguments). However, most teachers defined inquiry in a more limited way, i.e., as an approach that focused on evaluating sources and "determining which information is correct" or as an approach to cover content (Voet & De Wever, 2016, p. 62). Thus, Voet and De Wever concluded that criterialist beliefs were conducive towards teaching history as inquiry, but not sufficient. In line with Nitsche, other teacher beliefs and contextual factors appeared to mediate this "relationship".

TABLE 3. Outcomes of Different Studies

				Original score			Standardized score		
	Participants (mean age)	***N***	**Instr.**	**Obj.**	**Subj.**	**Cri.**	**Obj.**	**Subj.**	**Cri.**
Voet & de Wever (2016)	Teachers history (43 years)	22	Inferred	3 teachers	2 teachers	17 teachers	14%	9%	77%
Nitsche (2019)	Teachers-students history (27 years)	177	Other	1.89 (.54)	2.38 (.59)	3.50 (.39)	0.47 (.14)	0.60 (.15)	0.88 (.10)
	Teachers history (40 years)	12		1.85 (.69)	2.13 (.54)	3.63 (.36)	0.46 (.17)	0.53 (.14)	0.91 (.09)
Miguel-Revilla et al. (2020)	Teacher-students primary (2nd year)	143	BHQ	3.13 (.68)	2.69 (.77)	4.49 (.49)	0.52 (.11)	0.45 (.13)	0.75 (.08)
	Teacher-students primary (3rd year)	163		3.05 (.69)	3.06 (.76)	4.57 (.43)	0.51 (.12)	0.51 (.13)	0.76 (.07)
	Teacher-students history (master secondary)	124		2.40 (.69)	2.48 (.73)	4.86 (.56)	0.40 (.12)	0.41 (.12)	0.81 (.09)
Namamba & Rao (2016)	Teachers history (bachelor)	96	BHQ	3.30 (.62)	2.94 (.86)	4.00 (.48)	0.66 (.12)	0.59 (.17)	0.80 (.10)
	Teachers history (diploma)	34		3.29 (.66)	3.29 (.70)	3.93 (.47)	0.66 (.13)	0.66 (.14)	0.79 (.09)
Stoel, Van Drie, & Van Boxtel (2017)[3]	Students, pre-university (17 years)	95	BHQ		3.17 (.62)	4.40 (.49)		0.53 (.10)	0.73 (.08)
Mierwald (2020)[4]	Students, pre-university (17 years)	161	BHQ	3.47 (.71)	2.81 (.73)	4.58 (.53)	0.58 (.12)	0.47 (.12)	0.76 (.09)
Stoel, Logtenberg et al. (2017)[5]	Students, higher general education (17 years)	556	Other	3.62 (.75)		4.52 (.68)	0.60 (.12)		0.75 (.11)
	Students, pre-university (18 years)	366		3.39 (.69)		4.71 (.63)	0.56 (.12)		0.79 (.11)
	Researchers (historians)	7		2.22 (.73)		5.17 (.43)	0.37 (.12)		0.86 (.07)
Wiley et al. (2020)[6]	Students, university (19 years) – AP in history	56	Other	2.8		4.9	0.47		0.82
	Students, university (19 years) - Non-AP history	95		3.0		4.6	0.50		0.77
	Students, high school (16 years) – AP in history	48		2.2		4.9	0.37		0.82
	Students, high school (16 years) - Non-AP in history	82		2.9		4.5	0.48		0.75
	Students, middle school (12 years)	345		3.7		4.2	0.62		0.70
Barzilai & Weinstock (2015)	Students, university (28 years)	481	ETA	6.58 (1.43)	4.19 (1.37)	6.16 (1.39)	0.66 (.14)	0.42 (.14)	0.62 (.14)
Barzilai, Thomm, & Shlomi-Elooz (2020)[7]	Students, university (25 years)	104	ETA	6.81 (1.65)	3.88 (1.44)	6.13 (1.55)	0.68 (.17)	0.39 (.14)	0.61 (.16)
Thomm, Barzilai, & Bromme (2017)	Students, university (27 years)	184	ETA	6.46 (1.63)	4.20 (1.60)	6.24 (1.39)	0.65 (.16)	0.42 (.16)	0.62 (.14)
Iordanou, Kendeou, & Zembylas (2020)[8]	Students, university (24 years)	39	Livian	27 students	3 students	9 students	69%	8%	23%
Iordanou, Muis, & Kendeou (2019)	Students (12 years)	35	Livian	20 students	5 students	10 students	57%	14%	29%
	Students, university (22 years)	23		15 students	1 student	7 students	65%	4%	31%
Ioannou & Iordanou (2020))	Students, primary (12 years)	79	Livian	44 students	13 students	22 students	56%	16%	28%

Note: 'Standardized score' columns present proportional mean-scores by dividing outcomes by the maximum score on each perspective (ranging from 4-points to 10-points Likert-scales). When available, proportional standard deviations are presented within brackets. Studies that classify participants within one epistemic perspective, are recalculated into percentages.

[3] Pre-test scores are used. An average mean score is calculated for the experimental and control condition (taking differences in sample size into account).

[4] An average mean score is calculated for the three conditions (taking differences in sample size into account).

[5] An average mean score is calculated for both dimensions related to objectivity (knowledge and knowing).

[6] Mean scores were inferred from figures (bar graphs). Exact mean scores and standard deviations were not included in the article. For university students, we report the outcomes of study 2 (because this study included the number of participants with AP-status and non-AP-status).

[7] Mean scores and standard deviations are presented from the ETA in combination with the unfamiliar topic (Livia case). This makes the results more comparable to other studies with the ETA and the Livian war scenario. The study found no significant differences between epistemic perspectives with familiar and unfamiliar topic. The article describes two studies. Results are reported from study 1. For this overview, study 2 didn't add any extra information.

[8] Two students that exhibited a mix of absolutist and multiplist beliefs were divided over the two perspectives.

Wansink et al. (2017) added to studies on history teachers' instructional preferences by focusing on the learning goals of prospective history teachers (*n*=48). Their study differentiated between two epistemic perspectives and classified learning goals as *factual* or *interpretative*, finding that all student-teachers reported learning goals that focused on history as interpretation (critical, constructive, perspective-taking), but that 30 student-teachers combined these goals with goals related to moral reasoning or identity. In another study, by Wansink et al. (2016), prospective teachers reported that their teaching of history was more factual and less interpretational, in spite of their preference. Wansink's study corroborated the finding of Voet and De Wever (2016) that contextual factors influenced the (perceived) ability of history teachers to design epistemically rich teaching practices and goals for history education.

Finally, Sakki and Pirttilä-Backman (2019) similarly explored the relationship between epistemic perspectives and goals for history teaching among 633 history teachers from ten European countries. All teachers rated the importance of 12 learning goals and four statements that focused on epistemology. In general, all teachers rated critical thinking, argumentation, and working with sources as the most important goals of history teaching, and goals related to nation building, patriotism, and moral virtues as least important. Statements related to nuanced epistemic beliefs were also rated higher than statements related to naïve beliefs. However, results showed that epistemic beliefs did predict goal orientation: teachers who valued objectivism relatively highly also rated goals related to *moral virtues and patriotism* higher, whereas teachers who reported a relatively high agreement with both nuanced epistemic statements also reported a higher agreement with goals related to critical thinking and "learning from the past".

Epistemic beliefs: what ideas do teachers hold and how is this related to expertise in history

Almost all studies with teachers evaluated epistemic beliefs using the model of Maggioni (see Table 1). Only the studies of Wansink and colleagues (2016, 2017) and Sakki and Pirttilä-Backman (2019) adopted a different approach. As can be seen in Table 3, all studies found that teachers strongly valued nuanced epistemic (criterialist) beliefs (Miguel-Revilla et al., 2021; Namamba & Rao, 2016; Nitsche 2019). Voet and De Wever (2016) classified the majority of history teachers (77%) as criterialist. The study of Miguel-Revilla et al. (2021), which looked at 430 pre-service teachers in Spain (*n*=143, second year primary; *n*=163, third year primary; *n*=124, master secondary education), found that teacher-students in secondary education who held a bachelor's degree in history or art-history scored significantly higher on criterialist beliefs than students enrolled in a second- or third-year bachelor's degree in primary education. However, the study of Namamba and Rao (2016) did not find a significant difference in criterialist beliefs between teachers with a bachelor's degree in history and teachers with a diploma in history teaching.

With regards to objectivism, studies by Nitsche (2019) and Miguel-Revilla et al. (2021) found that teachers predominantly held a "neutral" position. Interestingly, in Namamba and Rao's study, teachers valued copier items relatively highly (M=.66, SD=.12). In line with expectations, Miguel-Revilla et al. (2021) found a difference with a large effect-size between teacher-students with a bachelor's degree in history and students enrolled in a bachelor's program for primary education. However, Namamba and Rao found no differences between teachers with different educational levels on this perspective.

Regarding subjectivist beliefs, studies found that teachers hold a neutral position (scores ranged between 0.41 and 0.6). However, no clear trend could be discerned. For instance, in Miguel-Revilla et al.'s study, the value attributed to subjectivist items was higher among third-year primary students than among second-year students, whereas master students in secondary education rejected the items more strongly than did the second-year students. This U-turn (or N-turn) suggests that subjectivism is difficult to calibrate, and that development based on group differences is difficult to interpret. In contrast, Namamba and Rao (2016) found that teachers with a bachelor's degree in history rejected subjectivist beliefs significantly more than teachers with a diploma in education.

In general, teachers scores on different epistemic perspectives were in line with expectations, although results were not unambiguous. Most studies supported the idea that educational level was related to agreement with criterialist and rejection of objectivist ideas, but across and within studies, scores on subjectivism were more difficult to interpret. The findings of Namamba and Rao differed from other studies, both in the mean scores attributed to the different perspectives, as in the differences found between educational levels of history teachers.

Contextual factors that constrain teaching epistemic beliefs

Several studies with teachers explored contextual factors that might influence a teacher's ability to translate their epistemic ideas into goals and learning environments that could foster the development of nuanced beliefs among students. Wansink et al. (2016) defined several factors that a (prospective) teacher needed to be certain of before they could teach the "uncertainty" of interpretational history. Authors called this the "certainty paradox". Teachers needed to be confident of their ability to manage a classroom and create a secure learning environment. Furthermore, they needed sufficient pedagogical knowledge to select materials and organize learning activities. And, finally, a firm grasp of subject matter was needed to discuss multiple perspectives. Besides these intrinsic factors, the work and learning environment (school culture, beliefs about students' cognitive abilities, interactions with students, textbooks or tests, and teacher training) were defined as important extrinsic factors that limited or increased the possibility of transferring epistemic beliefs into constructivist goals for history teaching. In their interview study, Voet and de Wever (2016) found that teachers often reflected on the time allotted for history lessons, on their own beliefs about students' capabilities for engaging in inquiry tasks (especially in lower levels and tracks) and on their own pedagogical knowledge (selecting suitable materials and organizing inquiry-based activities) as important constraints.

The importance of secure subject matter knowledge as a prerequisite for a teaching approach that fosters epistemic reflection, corroborated findings that showed the relatedness between teachers' educational level and epistemic perspective (Miguel-Revilla et al., 2021; Voet & De Wever, 2016). The number of history courses, in particular, appeared to be supportive of more criterialist epistemic beliefs (e.g., Nitsche, 2019). A question remained, though, about the extent to which teacher training supported teaching history as interpretation. Nitsche concluded that courses in history didactics did not influence prospective history teachers' epistemic ideas. However, Mierwald et al. (2016) compared beginning and advanced prospective history teachers and found a large difference in the rejection of objectivism and a small difference in criterialism. Wansink et al. (2016) concluded that the discrepancy reported by prospective teachers between teaching history as more factual and less interpretational than they would prefer, decreased during teacher training.

Finally, the study by Sakki and Pirttilä-Backman showed that socio-cultural contexts influenced teachers' epistemic beliefs. In this study, cluster analysis identified a systematic difference between countries. Researchers defined three clusters: (a) *critical thinking* (Austria, Netherlands, Germany), (b) *moral virtues and patriotism* (Belarus, Estonia, Serbia), (c) *historical consciousness* (France, Italy, Finland).

Discussion

In this review we focused on four questions. First, we explored how studies conceptualized and approached epistemic beliefs in history education. Second, we discussed the relationships studies found between epistemic beliefs in history and other constructs (e.g., domains and topics, historical reasoning, and beliefs about teaching and learning). Third, we described and compared the epistemic beliefs found among history students and teachers, and explored the relatedness with differences in age and educational backgrounds. Finally, studies were analyzed for promising pedagogical principles, as well as for factors that might influence a teacher's ability to design "epistemically rich" learning environments. In this discussion, we will summarize the results,

reflect on several questions regarding conceptualization and operationalization, and draw connections between studies with students and teachers.

Conceptualizing and operationalizing epistemic beliefs in history

In line with studies prior to 2016, most studies in this review conceptualized epistemic beliefs based on a developmental framework. These studies defined epistemic development as a progression through three coherent stances or perspectives. Only two studies departed from a purely dimensional framework and defined underlying dimensions of epistemic beliefs without referring to developmental stadia. An interesting development in recent studies was that most studies integrated aspects of both developmental and dimensional frameworks. For instance, several studies operationalized items for three epistemic perspectives, based on multiple underlying dimensions (e.g., Barzilai & Weinstock, 2015; Nitsche, 2019). Furthermore, most studies analyzed developmental scores in a somewhat dimensional manner, by presenting mean scores on different perspectives.

Relationships between epistemic beliefs and other constructs

The studies in this review contributed to our understanding of the domain-specific nature of epistemic beliefs in history. For instance, the studies of Barzilai and colleagues (Barzilai & Weinstock, 2015; Thomm et al., 2017) showed that epistemic beliefs, as well as epistemic judgments, differed between history and biology—indicating that, in history, knowledge is regarded as more uncertain and subjective, which leads to a relatively higher score on multiplism. In addition, Barzilai, Thomm, and Shlomi-Elooz (2020) found that epistemic beliefs, in contrast to epistemic performance, are less influenced by specific topics.

Multiple studies in this review demonstrated the relationship between epistemic beliefs and metacognitive processing, and contributed to our understanding of how (nuanced) epistemic beliefs support students' performance and teachers' pedagogical decision-making. Iordanou and colleagues showed that students with an evaluativist epistemic perspective engaged somewhat more in (low-level) epistemic processing, use of learning strategies, and integration of multiple accounts in a summary (2019; 2020). Interestingly, in these studies, as well as in the study of Barzilai, Thomm, and Shlomi-Elooz (2020), epistemic processing only took place when accounts contradicted students' own prior knowledge. Furthermore, students with more nuanced beliefs integrated more (structural) causes in their essays and corroborated sources more explicitly (Wiley et al., 2020). This study also separated epistemic thinking from students' general ability and showed that epistemic ideas uniquely predicted performance. Finally, across multiple studies a correlation was found between (criterialist) epistemic belief and students' interest in history. An interesting finding of Stoel, Van Drie, and Van Boxtel (2017) was that this correlation increased after a lesson unit that included explicit classroom reflection on epistemic questions.

Our review also showed that nuanced (criterialist) beliefs supported teachers' inclination towards more student-centered approaches and teaching history as inquiry (Voet & de Wever, 2016; Namamba & Rao, 2016). Moreover, Namamba and Rao found that objectivist, as well as subjectivist beliefs correlated with teacher-centered approaches. However, the study of Nitsche (2019) did not corroborate these relationships. Several studies found a relationship between epistemic beliefs and teachers' goal-setting in history education. For instance, Wansink and colleagues (2016, 2017) showed that prospective history teachers in the Netherlands formulated goals related to two different epistemic "standards". Sakki and Pirttilä-Backman (2019) found that goals related to *moral virtues and patriotism* were rated higher by teachers who valued objectivist ideas (relatively) more, whereas goals related to critical thinking were related to the value that teachers attribute to criterialist ideas. This study, across ten different countries, also supported the idea that epistemic beliefs were related to socio-cultural contexts.

Overall, a recurring finding among studies (both with teachers and students) that used a developmental framework was that relationships between beliefs and task performance were

mainly found with the more nuanced perspectives (criterialist or evaluativist), although correlations were often weak to moderate. Criterialist items focused on students' appreciation of history as disciplinary inquiry, the interpretative nature of historical knowledge, and methods for evaluating multiple (contradicting) sources. Stoel, Logtenberg et al. also identified correlations only for the dimension that focused on methodological criteria. Most studies found no or idiosyncratic relationships between reasoning, and objectivist or subjectivist perspectives. For these perspectives, the question asked by Mierwald et al. (2016) is still relevant: "Do they affect it at all?"

Outcomes on epistemic beliefs and age- and educational differences

We analyzed and compared the epistemic belief scores of different studies in this review. All studies found a positive value of ideas connected to criterialist beliefs with students and teachers, although studies with the *ETA* estimated these scores relatively lower than studies with the *BHQ* and other instruments. When we compared results of studies that used the *BHQ* with teachers and students, we found that teachers scored (marginally) higher on criterialist items (Miguel-Revilla et al., 2021; Namamba & Rao, 2016) than pre-university students (Mierwald, 2020; Stoel, Van Drie & Van Boxtel, 2017). Furthermore, several studies found differences between groups of teachers or students related to differences in educational backgrounds in line with expectations (Miguel-Revilla et al., 2021; Stoel, Logtenberg et al., 2017).

When we explored outcomes on the objectivist perspective, a consistent trend was discerned from a strong rejection by academic historians (Stoel, Logtenberg et al., 2017) to a moderate agreement by 11th-grade pre-university and university students found by Mierwald (2020) with the *BHQ*, and Barzilai and colleagues (2015, 2017, 2020) with the *ETA*. *ETA*- scores appeared to estimate objectivism slightly higher than studies with the *BHQ*. Other studies also showed an age- (and education-) related development regarding objectivism in line with expectations (Miguel-Revilla et al., 2021; Stoel, Logtenberg et al., 2017; Wiley et al., 2020). Only Namamba and Rao's (2016) study failed to reproduce these findings. Their study found that Tanzanian history teachers in general reported a positive attitude towards objectivism, while finding no differences between teachers with a bachelor's degree and teachers with a diploma in education. It was striking that this study found divergent outcomes on multiple perspectives. In connection to Sakki and Pirttilä-Backman (2019), these outcomes might be related to the socio-cultural context in which the study was conducted.

When we explored subjectivism, we found that all scores fluctuated around the middle of the scale and no clear trend could be discerned between students, teachers, and expert historians. For instance, Miguel-Revilla et al. (2021) found that students in third-year primary education attributed a higher value to subjectivist items than both students in second-year primary education, as well as history master students in secondary education. This corroborated the finding of Stoel, Logtenberg et al. (2017) that experts valued items related to subjectivity in largely varying ways depending on their research paradigm. Thus, Stoel and colleagues concluded that a coherent perspective (or "stance") on subjectivity could not be defined.

Wiley et al.'s (2020) research problematized the assessment of epistemic beliefs among young students with their empirical finding that these beliefs had not yet formed, indicating that among the youngest age groups these beliefs might be regarded as pre-epistemic. More research is needed, however, to differentiate clearly between naïve and pre-epistemic beliefs.

Principles and barriers for fostering nuanced epistemic beliefs

Several studies explored how contextual factors mediate the "transfer" of epistemic beliefs to historical reasoning tasks (with students) or to pedagogical decisions (with teachers). Studies with students established prior knowledge as an important mediating variable (e.g., Barzilai, Thomm, & Shlomi-Elooz, 2020; Iordanou et al., 2020). In interviews with teachers, beliefs about

students' abilities, grasp of content knowledge, availability of historical sources and inquiry tasks, and the duration of history lessons were mentioned—among others—as important factors (e.g., Voet & de Wever, 2016; Wansink et al., 2016, 2017).

However, contextual factors could also support the development of nuanced epistemic ideas and the transfer of these beliefs into "action". Educational background, in particular, appeared to be an important factor. Several studies with history teachers showed that the amount of training as a historian correlated with the sophistication of epistemic beliefs (e.g., Miguel-Revilla et al., 2021; Namamba & Rao, 2016; Nitsche, 2019). Interestingly, Nitsche found that courses in history didactics did not contribute to this development. In addition, Wiley et al. (2020) attributed the finding that students in the AP-program held more sophisticated epistemic beliefs to the pedagogical approaches in these classes (e.g., working with sources and inquiry questions). Other studies suggested that explicit reflection on epistemic questions, providing students with epistemic scaffolds (i.e., a "disagreement explanation", highlighting, collecting claims), and working with primary sources might lead to a higher agreement with items related to criterialist beliefs, as well as epistemic performance (Barzilai, Thomm, & Shlomi-Elooz 2020; Barzilai, Mor-Hagani et al., 2020; Mierwald, 2020; Stoel, Van Drie, & Van Boxtel, 2017).

Conclusion

Recent studies in history education have made significant contributions to our understanding of the role epistemic beliefs play in history teaching and learning. Most importantly, these studies reinforced the idea that epistemic beliefs influence meta-cognitive processes and explain (a certain level of) variation in teachers' and students' epistemic cognition. Studies showed that epistemic ideas influence (although do not determine) constructs, such as goal setting, teaching orientation, epistemic strategies, and outcomes of historical reasoning. However, studies also indicated that these correlations are primarily found with items that assess criterialist or evaluativist epistemic ideas and raised several questions regarding conceptualization and operationalization. These issues will be discussed below.

Previous results found with the *BHQ* showed that classifying students within a specific stance was problematic (VanSledright & Maggioni, 2016), with research conducted before 2016 suggesting that qualitative data was needed to substantiate this classification. Interestingly, in this review too, only studies with a qualitative element assigned students or teachers to one epistemic perspective (Voet & de Wever, 2016; Iordanou et al., 2020; Iordanou et al., 2019; Ioannou & Iordanou, 2020). It is striking that the studies of Iordanou and colleagues, based on the Livian War scenario, classified students predominantly as objectivists, as this finding is not fully supported by other studies. In general, participants in studies that used the Livian War scenario tended to score higher on objectivism than participants in studies that used the *BHQ* or other instruments. However, in their studies with the Livian War scenario and the *ETA*, Barzilai and colleagues found that students agreed with both an evaluativist perspective and an absolutist perspective. Thus, the question may be raised of whether assigning participants to one "dominant" perspective is capable of covering the nuances in epistemic thinking?

In contrast, most studies in this review that built on a developmental framework did not aim to categorize students within a specific perspective. Instead, these studies presented mean scores for each perspective. The benefit of this approach is that all data are used. Furthermore, it embraces the fact that people can hold multiple, partly contradicting beliefs. Such an approach can be useful when exploring a preferred perspective, investigating correlations with other constructs, or measuring differences between groups, or between pre- and post-tests, as studies in this review showed. However, this approach also complicates interpretation; for instance, how does one interpret a positive score on both an objectivist and subjectivist perspective? Or agreement with both an objectivist and criterialist perspective? These studies appear to operationalize epistemic perspectives as if they are dimensions of epistemological beliefs.

Alternatively, a dimensional framework offers researchers a flexible and adaptive approach to conceptualizing epistemic beliefs, which can be tailored towards specific aspects of historical reasoning, such as causal historical reasoning (e.g., Wiley et al., 2020). However, a limitation of these instruments is that it is difficult to interpret outcomes on different scales. Studies that used this approach focused primarily on comparing differences between groups, and on exploring correlations between values found on dimensions of epistemic thinking and outcomes of reasoning tasks, strategies, and interest.

With respect to how epistemic beliefs are conceptualized, this review showed that a development can be discerned towards integrating developmental and dimensional approaches. This development allowed researchers and practitioners to assess epistemic ideas more adaptively (depending on research or educational goals) and to analyze results in finer detail (e.g., by exploring specific dimensions in relation to epistemic development). The development of an epistemic belief scale tailored toward causal historical reasoning (Wiley et al., 2020) is one example of how studies have aimed to align the broader construct of epistemic beliefs in history with specific types of reasoning.

Our comparison of how studies conceptualized and evaluated epistemic ideas also raised questions for future research. An important question remains as to how to qualify outcomes on epistemic dimensions in dimensional studies. Stoel, Logtenberg et al. (2017) theorized that a "mild" rejection of objectivist items, in combination with an agreement with items that emphasize methodological criteria, might indicate a criterialist perspective. However, it remains unclear as to where the "tipping points" between naïve and nuanced beliefs lie. Another question focuses on outcomes found with developmental studies. Most recent studies reported mean scores for each perspective, which raises the question of how these scores should be interpreted. A solution might be to diagnose students on their preferred perspective, although this might lead to overestimating a specific stance, as the studies of Iordanou and colleagues suggest. Another solution might be to return to an approach originally suggested by Maggioni and colleagues, who calculated "consistency scores". In this approach, a percentage is calculated based on the amount of objectivist and subjectivist items that students reject and the amount of criterialist items that students value. However, the premise of this approach is that students ought to reject both objectivist and subjectivist items, which is problematic given that idiosyncratic results on subjectivity were found even among experts (Stoel, Logtenberg et al., 2017). It also obscures the finding of many recent studies that students can positively value both objectivist and criterialist beliefs.

In light of this, future research could focus on questions regarding the validity of both objectivist and especially subjectivist perspectives. Studies found that objectivist ideas develop in line with expectations between students and teachers. However, almost no correlations with aspects of historical reasoning or interest were found. Wiley et al.'s (2020) study was an exception, though. This study found that viewing historical knowledge as simple and certain was negatively related to outcomes on a causal reasoning task. Regarding subjectivism, studies found largely varying outcomes between students and teachers that could not be interpreted. Furthermore, almost no relationships were found between subjectivist ideas and aspects of historical reasoning.

Another focus for future studies could be to validate and calibrate different instruments (e.g., collecting and comparing scores with the *BHQ*, the *ETA*, and scores on dimensional questionnaires, in one sample). It also remains important to compare outcomes on the questionnaires with more qualitative approaches that enable the inference of epistemic ideas from students. By doing this, these studies could strengthen the predictive power and concept validity of the instruments. It might never be possible to "solve the riddle", but future research could provide theory and practice with multiple instruments that can be applied flexibly depending on which aspects of epistemic thinking researchers or teachers want to illuminate.

From this review, we draw several implications for practice. The primary implication from research with students is that history education should challenge students' epistemic beliefs. Studies have shown that these beliefs are an important aspect of students' self-regulative behavior. Working with inquiry tasks based on multiple sources from different perspectives, discussing

controversial issues, scaffolding argumentation, and explicitly discussing why experts disagree, are important principles towards this goal. Furthermore, reviewed studies suggest that it is important for teacher training to teach interpretational history, and explicitly reflect with (prospective) history teachers on their epistemic beliefs and on the relationship between these beliefs, ideas about learning and teaching, and goals for history education. This suggestion is in line with theoretical contributions in recent years that discussed the importance of epistemic reflection and reflexivity in teacher training and professional development (e.g., Hofer, 2017; Mathis & Parkes, 2020). Teacher training should show prospective history teachers that epistemic beliefs are susceptible to change. Furthermore, teacher training should provide teachers with curriculum materials, or support them in (co-)designing these materials, but also focus on "counterbalancing" the impact of contextual factors such as school culture or (national) curriculum demands.

For educational purposes we assume that both developmental and dimensional approaches provide useful frameworks for teachers to address epistemological questions in their classrooms and to bring these beliefs "to the surface". An important advantage of the dimensional approach is that it can support teachers in formulating specific epistemic questions about concrete history tasks and topics, and it can promote reflection on different aspects of epistemic thinking in history. Questions may focus on the nature of historical knowledge, historical knowing, or criteria for judging the validity and reliability of historical sources and accounts. In contrast, a developmental framework allows teachers to diagnose students' epistemic ideas more specifically, conceptualize progression, and provide adequate feedback. Although studies suggest that it remains difficult to classify students within a specific perspective and the expression of epistemic ideas may vary across contexts, qualitative remarks of students nevertheless provide rich formative information on how students make sense of history. Developmental frameworks may help teachers in making sense of this information.

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