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The overuse of self-report in the study of beliefs in education: epistemological considerations

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ABSTRACT

The last few decades abound in studies concerned with what teachers, students, parents, and other participants in the educational process believe about a wide variety of issues. Most of these studies follow methodological procedures based on reports that people make about their own beliefs. We argue that this strategy is seriously flawed under certain conditions that often obtain and, therefore, we should revise what we know so far about people's beliefs. We also suggest a more suitable alternative procedure.

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Introduction

Beliefs of teachers, students, student teachers, parents, and other agents involved in the educational process have become a main focus of research in contemporary education (for some reviews, see Confrey 1990; Pajares 1992; Fang 1996; Wittrock 1996; Hofer and Pintrich 1997; Wideen, Mayer-Smith, and Moon 1998; Horwitz 1999; Genishi et al. 2001; Kane, Sandretto, and Heath 2002; Muis 2004; Marcos and Tillema 2006; for more recent studies, see e.g. Maggioni, VanSledright, and Alexander 2009; Hoskins, Lopatto, and Stevens 2011; Mägi et al. 2011; Morris 2011; Beghetto and Baxter 2012; Beswick 2012; Smith et al. 2012; Chen, Metcalf, and Tutwiler 2014). In the great majority of the studies, the instruments and procedures used to identify people's beliefs (Likert-type scales, questionnaires, belief inventories, surveys, interviews, focus groups, etc.) are based upon what people *report* they believe. Sometimes participants are explicitly asked to avow their beliefs; more often, though, they are presented with questions or other items that are supposed to elicit such avowals in one way or another. Marcos and Tillema (2006, 116) call this family of procedures *questioning*:

With regard to methodology, the most common approach in research of this type is questioning. Questioning is based on the use of systematic, (semi-) structured or open questions that are given to a teacher or a group of participants to assess their beliefs, values, attitudes, and thoughts. Traditionally, there are three major kinds of data collection instruments: interviews, questionnaires, and checklist surveys.

Some studies incorporate as well observational procedures or other techniques that are combined with the use of self-reports, but they still hinge too much on the latter (e.g. Sneider and Pulos 1983; Veal 2004; Youngs 2007; Herron 2010). As Genishi et al. (2001, 1187) point out, 'several researchers do observe teachers and interview or survey them, but for the most part, such observations are limited'. Actually, it is really difficult to find contemporary studies in which the identification of beliefs does not strongly depend on some report-based strategy. So henceforth – and following a suggestion made by one of us in a previous work (Gaete 2013) – we will refer to this practice as the *standard strategy* to learn about people's beliefs.

An assumption underlying the standard strategy is that people's self-reports are a reliable source of information about their beliefs. In words of Alexander and Dochy (1995, 416), who have made this assumption explicit in one of their studies: '[W]e assumed that the responses that participants shared would be accurate reflections of their thoughts and views'. In this paper, we argue that this assumption is usually mistaken; more specifically, that under certain common conditions that we will spell out, to ask people to avow their beliefs, either by explicitly telling them to do so or, more subtly, by asking them indirect questions to the same effect, is far from being the best way to find out what they really believe.

The issues underlying these considerations are important in their own right, but they become especially worth attending to if we take into account certain worries that researchers have lately been expressing not only about the field of beliefs in particular but also about the quality of educational research in general. Regarding the former, there are at present pending epistemological and methodological issues that are turning into major obstacles for good research. Thus, for instance,

despite the relatively long history of research in the area of teacher beliefs and practices, there has been relatively little inquiry into the nature of assumptions underlying dominant theoretical and methodological approaches. The recent emergence of more diversity in the theoretical perspectives used to conduct research in this area is likely to make substantial contributions to discussions about theory, methods, and findings. (Speer 2005, 363)

In the same line, Skott (2015, 14) has very recently observed that 'the experiences from the last three decades invite us to reconsider the role of dominant theoretical frameworks in the field, including [...] the main methods of inquiry'. This is precisely what we do here: we try to make evident that some of the methodological procedures that have dominated the study of beliefs for the last few decades are often unreliable. We also suggest an alternative strategy.

As for the quality of educational research in general, an intense methodological debate has followed recent US policies on research funding (see, for example, Howe 2004; Eisenhart 2006; Denzin 2009; Rudolph 2014; Southerland, Gadsden, and Herrington 2014; Wieman 2014). Several issues have been raised on what counts as good educational research and, relatedly, what sorts of studies are worth funding. We will by no means be able to settle all the questions at stake in this complex discussion, but we hope our considerations will be a small contribution to the debate by bringing to light methodological problems that researchers *must* deal with if they really want to be rigorous in studying people's beliefs.

The main problems of the standard strategy

Curiously enough, the use of self-reports to ascribe beliefs to people is a pervasive practice in social research. We say 'curiously enough' not only because most psychotherapists, detectives, lawyers, victims of scam, and adults in general understand very well the huge difference between believing X and *saying* that one believes X, but also because over the last hundred years sensible doubts about the soundness of report-based methodological approaches to mental life have been continuously made by many researchers and theorists from very different fields and orientations. We are not talking about marginal criticisms. For example, both Freud and Malinowski marked a before and after in their disciplines by arguing that, in the context of psychological and anthropological research, respectively, people's declarations about the content of their beliefs can be extremely untrustworthy (see, e.g. Erickson 1986; Bloch 1998; Lewkowicz and Bokanowski 2011) – a view that remains widely accepted among clinical psychologists and anthropologists whether or not they are fond of these theorists. Even such a famous advocate of interviews as Piaget (1951) warned us that *only in certain cases* one is entitled to conceive of the interviewees' declarations as corresponding with their thoughts. More recently, in the seventies, Nisbett and Wilson (1977) offered strong evidence against the accuracy of self-reports on cognitive processes. Further criticisms have been put forward since then by sociocultural theorists and other researchers (see, e.g. Schoultz, Säljö, and Wyndhamn 2001; Halldén, Haglund, and Strömdahl 2007; Hoffman and Seidel 2015).

Despite all this, a great deal of social research on beliefs and other cognitive states continues to ground its findings in people's direct and indirect reports on such states. We have some suggestions about why this is so, but before getting into that let us state as clearly as we can the main problems of this strategy in the context of educational research specifically.

Dishonesty and unconscious beliefs

First, people are very often inclined to hide or misrepresent some of their thoughts – to others and even to themselves. It is because of this that test-makers have developed such measures as sincerity scales. Leaving aside the debate on the extent to which these measures are helpful, only a small portion of the report-based educational research on beliefs is actually conducted by means of procedures that incorporate them. Perhaps researchers assume that people do not have reasons to lie about educational issues (as they would if they were talking about, e.g. their sexual life). But this would be an unjustified assumption. Consider, for example, the case of a survey carried out by one of the authors of this paper (Gaete and Ayala 2015). About 80% of the respondents declared that they believed that a socially diverse school was preferable to a school in which families are all alike. This, however, is the answer of a representative sample of the citizens of a country that at the time the survey was conducted had one of the most homogeneous, segregating scholar systems in the world – as well as an extremely inequitable society – whereas, as a reaction to that, a strong anti-segregation discourse had colonized the media. So the author was forced to consider at least the possibility that many of the surveyed subjects decided to lie in order to avoid the embarrassment of revealing their politically incorrect rejection of diversity.

The distorting influence of social desirability and other aspects of the social context over self-reports is well documented (see, e.g. Price and Allen 1990; Bersabé, Fuentes, and Motrico 2001; Hayes, Glynn, and Shanahan 2005; Hornstra, Van den Bergh, and Denessen 2011) and has been openly noted in the field of teacher beliefs:

Many individuals feel obligated to present favorable self-images to researchers resulting in response inaccuracies based on the contrived perceptions of social desirability [...] Reporting and interpretative errors are so pervasive that in a study investigating how experts' self-reported beliefs related to problem solving, Feldon [...] lamented 'participants' self-explanations are largely inaccurate' [...] The paradigm becomes increasingly egregious as many teachers believe that certain epistemological and pedagogical beliefs are socially desirable [...]. (Hoffman and Seidel 2015, 120)

Imagine, for instance, what can happen when teachers are asked to voice pedagogical beliefs that could make some of their colleagues feel uncomfortable or react with disapproval. In a study reported by De Groot (2002), researchers 'became concerned that teachers in particular were reluctant to express divergent opinions in a highly public forum such as a focus group' (51). This should be a quite a disquieting concern for a researcher who is to count on teachers' self-reports for establishing what they believe, even if she uses some sort of measure to control social desirability. For not only is the validity of such measures a matter of controversy (see, e.g. Johnson, Fendrich, and Hubbell 2002); on top of this, and just as what happens with lie detectors, few studies actually resort to the use of the measures in question.

Social desirability and other motivations (convenience, fear, lack of interest, etc.) can make someone hide her thoughts not only from others but from herself too. Suppose, for instance, that a right-wing school principal has witnessed how teachers have been successfully developing their students' reasoning by using strategies based on Freire's critical pedagogy, which includes a handful of left-wing ideas. Having formed the belief that such an approach can be very effective, she may then 'repress' this belief in order to avoid the anxiety that advocating ideas from Freire's political framework would produce on her.

Actually, people can form beliefs without being aware of that in the first place – just like many of the cultural beliefs we all acquire through the process of socialization (see, among many others,

Bourdieu 2012) or the pedagogical beliefs which Lortie (1975) famously attributed to teachers' previous schooling experience. There is in fact general agreement that teacher beliefs can be, and frequently are, unconscious, in such a way that 'even the most objective practitioners may not consciously recognize their own beliefs during teaching' (Hoffman and Seidel 2015, 109; see also, among many others, Nespor 1987; Kagan 1992; Martín et al. 2014). Also, the now widespread idea of the school's hidden curriculum feeds largely on the fact that students are not aware of everything they learn at school (see, e.g. Giroux and Penna 1979; Jackson 1990). Even supporters of the use of self-reports have granted that researchers should avoid items requiring that respondents have a high level of self-awareness (see, e.g. Haefel and Howard 2010).

Ambiguity

Another factor that undermines the assumption that people's belief reports are reasonably trustworthy, which holds especially for paper-pencil instruments, is the high ambiguity of written language (see, e.g. Ray 1983; Holden and Edwards 1989; Bersabé, Fuentes, and Motrico 2001). Even if test-makers are extremely careful in designing the items so as to avoid misinterpretation, the level of ambiguity skyrockets when one has to read and answer questions about such quite complex issues as teaching theories or the sources of knowledge or the goals of education or the relations between poverty and learning (Gaete 2013). It is precisely beliefs regarding matters like these, however, that many educational studies are concerned with:

What does a teacher really mean, for example, when she says that she agrees that poverty is a major obstacle for learning? How exactly does this belief differ from the belief expressed by those who mark the 'strongly agree' option? Is it a difference in the degree of certainty or in the likelihood one would hold it, or act upon it, or even die for it? Or is it that one respondent takes poverty to be a major obstacle, whereas the other takes it to be a minor one? And what exactly do they mean by 'poverty' and 'obstacle'? Are they even talking about the same phenomena? Is the researcher? (Gaete 2013, 2)

Or take this case given by Speer (2005):

[C]onsider for a moment what stating, 'I believe groupwork is important' might mean to someone. One person might apply such a label to classrooms where groups of students are collaboratively constructing a proof. In another scenario, students are solving equations individually and checking answers with one another. Someone else might classify this second episode as groupwork. A multitude of other scenarios might be considered 'groupwork' by someone and there is no guarantee that the term evokes the same images for teachers, researchers, and readers, yet it (and similarly under-specified terms) are often used during research and in reports of findings. (368–369)

The latter has to do with a more general methodological issue known as *cognitive validity* (see, e.g. Koskey et al. 2010). Once again, even if some attempts have been made to measure this kind of validity, and leaving aside the question whether such attempts have been really successful and in which contexts, the standardized instruments employed in report-based educational studies on beliefs are very rarely tested for this. In the field of teacher beliefs, it is a rather common methodological complaint with very serious consequences (see, e.g. Speer 2005; Leatham 2006; Skott 2015).

Verbal expression, implicit knowledge, and inconsistent beliefs

Ambiguity may not be such a big problem for some report-based methods. During an in-depth interview, for instance, the interviewer can always ask for disambiguation and, moreover, bodily language and other non-verbal keys will often render that unnecessary. Still, an important problem that researchers will encounter even in interviews, focus groups, and other face-to-face procedures is that many people are not quite good at verbalizing some of their thoughts. This is obviously the case in many situations, for example, when participants are small children or non-native speakers or have to talk about a subject they are not conceptually equipped for. If you ask a first-year student teacher what are her beliefs about the source and validity of scientific knowledge, or a

primary student what she believes about the shape of the Earth, her best attempt to formulate an answer may totally misrepresent what she really believes (see, e.g. Schoultz, Säljö, and Wyndhamn 2001).

But more generally, people are not able to convey a large part of their subjective states. Farrell and Ives (2015, 14) have recently noted in discussing a study that there are ‘possible limitations of teachers articulating their beliefs’. In particular, ‘some teachers may not be able to verbalize why they have made a particular instructional decision’ (see also Leatham 2006). This difficulty to put into words certain beliefs is not a peculiarity of a small group of teachers, but part of a quite generalized phenomenon theorists usually point to by noting that many teacher beliefs are *tacit* or *implicit* (see, e.g. Nespor 1987; Clark 1988; Trumbull 1990; Kane, Sandretto, and Heath 2002). Nor is it a difficulty restricted to teachers, considering that implicit knowledge is part of everybody’s cognitive repertoire and that a long representational redescription process may be required in order for it to be accurately verbalized (Karmiloff-Smith 1992; see also Polanyi 1961; Bloch 1998). Actually, the process may last days, even weeks – far more than the hour or couple of hours that report-based procedures normally take – and may even need professional assistance. Hence the use of such procedures ‘may result in conscious fabrications [...], promulgate mischievous respondents, and contribute to deliberate response bias’ (Hoffman and Seidel 2015, 120).

Naturally, researchers can always – and sometimes rightly – *assume* that the participants of a study will be able to convey their thoughts accurately. In their report of a study about conceptions of knowledge and belief, for example, Alexander and Dochy (1995) tell us that they have ‘operated under the assumption that our adult participants have both the cognitive and linguistic skills required to respond to our questions about knowledge and beliefs’ (415). This assumption may be justified, especially if the participants are ‘experienced at framing complex concepts, like knowing and believing, in language’ (415). But how is this kind of conceptual experience established? The authors explain that some of the participants were ‘experts who conducted formal study and published in either the domain of knowledge or beliefs’ (417). Some others, however, were undergraduate students, and not necessarily in areas where epistemological concepts are customary. So even if they can be described as having experience with framing complex concepts in language, their alleged ability to express accurately their epistemological conceptions looks pretty much like an extra assumption – and one dangerously close to the misleading idea that someone can be an epistemologist without having studied epistemology.

Furthermore, as Pajares (1992) has noted in his well-known discussion on teacher beliefs, ‘all individuals, at some point in their lives, suffer attacks of cognitive (belief?) dissonance, where incompatible beliefs are suddenly thrust on them’ (319). In this vein, Niessen (as quoted in Akkerman and Meijer 2011) ‘showed how experienced teachers trained in problem-based education [...] struggle with advancing not one, but multiple conflicting epistemological beliefs’ (311). Indeed, harder than saying what one believes about a complex issue is to say what one believes about a complex issue when one cannot decide between different and even contradictory beliefs. A long, in-depth interview might fare well in some cases, especially when it gives the interviewee the space and the resources to handle the conflict. But there are too many other situations in which no interview will succeed – not necessarily because of a lack of expertise on the part of the interviewer, but because the verbal expression of cognitive dissonance, especially on certain subjects, may take even longer than the redescription process previously mentioned and may involve an exercise of both a high level of self-knowledge and a set of sophisticated linguistic and communicative competences that many people have not acquired.

Contextualism

So far we have put forward some problems of the standard strategy that are due to the fact that there are reasonable doubts about the assumption that self-report is reliable (as a source of information about beliefs). Further problems that are not related to this can be identified as well. One of them

has to do with an idea that only recently has started to be seriously considered in educational research on beliefs, namely, the idea that the context in which beliefs are expressed affects their expression not only because the way in which they are expressed – or the very fact that they are – is sensitive to that context, but also because one context can make people form beliefs that in another context would not have arisen. As Hoyles (1992) put it, ‘beliefs are situated – dialectical constructions, products of activity, context and culture’ (40; see also Speer 2005; Skott 2015). On this view, the situation a person is in is seen as a co-producer of her beliefs. Illustrative examples of this can be found in the field of public opinion studies, which provides an abundance of cases showing how the initial questions of a survey can influence the respondents’ views (see, e.g. Bargsted and Kedar 2009). It is also well-known, at least since the work of Tversky and Kahneman (1974), that the information available during interviews and other question-and-answer situations heavily affects people’s thinking. Thus, for instance, self-report requests can be permeated with the researcher’s expectations (Kane, Sandretto, and Heath 2002).

If this contextualist view is on the right track – as many think it is – then another problem associated with the standard strategy is that the situations in which self-report is elicited by researchers are usually very different from the situations in which the beliefs they are after are normally (co)produced. Thus, the fact that during an interview with a researcher, for example, in a school meeting room, parents form certain beliefs about the educational process of their children does not mean that at home they will form those same beliefs in making relevant decisions about that process. But the researcher may happen to be interested precisely in the beliefs involved in such decisions. More generally, given that report-based methods tend to be applied in rather ‘artificial’ situations – in the sense that they neither are nor resemble the situations related to the phenomenon researchers are ultimately trying to understand – the standard strategy could result in the wrong kind of information even if participants in the studies did say exactly what they believed.

Failure conditions for the standard strategy

Taking into account all of these problems, we can establish four conditions under which the use of self-reports to learn about people’s beliefs would not be the right methodological decision. We have called these conditions the *insincerity condition*, the *self-ignorance condition*, the *inexpressibility condition*, and the *out-of-situation condition*.

The insincerity condition obtains when participants in a study are strongly motivated to lie about what they believe. As we have pointed out already, there are many sources for this kind of motivation: social desirability, convenience, fear, etc. (We must note that this condition does not obtain when people can anonymously provide their views. Besides, researchers would be entitled to ignore this condition if they had a *proven* way to detect lies or to effectively handle them in some other way.)

The self-ignorance condition obtains when participants are likely to be unaware of their own beliefs. Again, there are many sources: age, presence of some motivation to keep things unconscious (e.g. identity issues, avoidance of anguish, etc.), origins of the belief, etc.

The inexpressibility condition obtains whenever participants are not well positioned to articulate their beliefs. This can be due to different reasons too. Perhaps the people in question have not mastered their language (consider the case of a little boy, or a non-native speaker, etc.); or perhaps they are not used to talking about certain topics (consider the case of someone who has never come across epistemological discussions and is required to say what she thinks about the relation between knowledge and justification); or perhaps they cannot make up their mind between two incompatible sets of beliefs; etc.

Finally, the out-of-situation condition obtains when the situation in which the belief is expected to be reported is too artificial in the sense explained above. For example, if we are interested in knowing about the beliefs actually guiding a student teacher’s pedagogical decisions when she teaches English to primary students during her practicum, the following are ways to bring about the out-of-situation condition: to ask her to complete a Likert scale at home; to participate in a focus

group at university; to make her say things about teaching in general rather than about teaching English to primary students; etc.

The need for an alternative approach

Some researchers may remain unconvinced that the problems just stated are enough to stop trusting the standard strategy. They may acknowledge that it does have its downsides, but since no method is perfect they may also take it that, in comparison with other procedures, the use of self-reports is equally or even more trustworthy (for a more elaborated version of this line of thought, see, e.g. Haeffel and Howard 2010). So far, as we know, however, no one has ever *shown* this to be the case. Furthermore, we do not agree that researchers are entitled to follow a defective procedure just because there are no better options. Suppose, for the sake of the argument, that no other methodological approach can provide us with a more accurate representation of people's beliefs than the standard strategy. Still, given that under one or more of the four conditions specified in the previous section there are very reasonable doubts (posited both by theorists and common sense) that self-reports will reliably provide the information researchers are after, the scientific thing to do is not to keep using this method but either to build a more reliable alternative or, until this is done, to *refrain* from using it. Lack of information is preferable to misinformation – and this should be especially taken into account in times of controversy about the scientific rigour of educational research.

At any rate, we do think that there is already at least one methodological procedure that is far more adequate than the standard strategy. But before going into this, let us briefly assess a couple of considerations that might make it tempting to stick to that strategy even when its failure conditions obtain.

According to Kane, Sandretto, and Heath (2002), to describe a teacher's beliefs by considering only her *professed views* is to tell just half the story. In order for the story to be complete, they say, one need consider also the teacher's *theories-in-use* or *thinking in action*, that is, those beliefs that actually guide the teacher's practice, even if they are unconscious or implicit and, consequently, the teacher cannot report them. We sympathize with this proposal if it is construed as inviting us to acknowledge the existence of undeclared or implicit beliefs that cannot be left out of the picture of teacher cognition. Alternatively, however, it might be interpreted as stating that teacher beliefs can be either of two kinds: the theories-in-use which underlie their teaching practices and the professed views which may or may not affect such practices. Thus, for instance, whereas a teacher's professed view can be that a certain theory provides the best approach to teaching, the beliefs actually guiding her teaching may be totally inconsistent with that theory. On this interpretation, professed views are not different from belief reports – mere narratives that may have no bearing on behaviour. Researchers who see things this way can then be tempted to resort to the standard strategy. Indeed, once teachers' professed views and the cognitions that actually underlie their teaching practices are construed as two radically different kinds of beliefs, restricting descriptions to either of them is certainly to tell just half the story – and given that professed views are conceived of as narratives, the use of some sort of self-report seems the appropriate methodological approach to access them, even if it is acknowledged that a different strategy must be followed to access beliefs of the other posited kind.

This position makes sense for the studies that are concerned with people's narratives as well as their cognition in action. In the case of those who are restricted to the latter, to describe people's narratives could be not to tell half the story but to tell *a whole different story*. Now many researchers, perhaps most of them, are interested in studying beliefs only insofar as they are somehow connected to people's behaviour. This is clearly so in the field of teacher beliefs, where a core idea – which Skott (2015) described as *the fundamental rationale* of the field – is that beliefs are 'an explanatory principle for practice' (25). It was largely because the views teachers hold were thought to be intimately connected with the things they decide to do in the classroom that many of the studies about teacher beliefs were conducted (see also, e.g. Speer 2005; Hoffman and Seidel 2015). In this context, if a

teacher participating in a focus group ends up saying the very contrary of what she really thinks because she does not want to make her colleagues uncomfortable, her declarations are not incomplete representations of her actual beliefs but simply false declarations. They are not the views in the light of which she actually conducts her behaviour and, to that extent, they cannot serve as (correct) explanations of that behaviour.

A similar motivation can be found underlying many researchers' interest in studying the beliefs of other participants in the educational process. For instance, it is partially to understand parents' involvement in the education of their children that researchers have studied parents' beliefs (see, e.g. Drummond and Stipek 2004); and the concern with students' beliefs about evolution is related, among other things, to the concern with how such beliefs can affect the students' learning strategies and performance (see, e.g. McKeachie, Lin, and Strayer 2002). In all of these cases, what people say they believe can be misleading and, therefore, the standard strategy could be inadequate even to generate a partial account.

This is why the attempt to combine the standard strategy with other methods is not a solution either. *Triangulation*, as this methodological mixture is commonly referred to, is highly valued within the scientific community and has even been posited as 'the heart of qualitative research's validity' (Davidson and Tolich, as quoted in Kane, Sandretto, and Heath 2002, 198). We would not go as far as to describe it like this, but we do agree that, as a general principle, the more sources of information researchers have, the more valid the results of their studies – even (and sometimes especially) when an integration of qualitative and quantitative approaches is involved (for qualms about this, see Denzin 2009; for a solid defence of theoretical integration that might apply to education, see Gaete and Gaete 2015). However, because self-reports can be a source of misinformation rather than of incomplete information, there may be no point in combining them with anything else. The triangulation of the results gathered by the use of any given method X with those collected by means of any other method Y must be explicitly avoided if either X or Y are unreliable. We will not improve our understanding of a certain phenomenon by combining a representation and a misrepresentation of that phenomenon. Triangulation, so far as we can see, is a powerful tool that can be used to identify methodological weaknesses as well as to build richer descriptions and explanations, but it cannot be used as a way to *solve* the deficiencies of any single method. A faulty procedure must be fixed *before* its results can be reliably triangulated.

Having said all that, we want to be clear that we are *not* saying that the standard strategy never works. Nor are we denying that the results of the thousands of report-based studies carried out so far in the field of beliefs can be informative about, for example, people's narratives. What we say is that if we are ultimately concerned with what people deeply believe (rather than with their belief reports) then the standard strategy is unreliable under certain conditions which, admittedly, often obtain (the insincerity condition, the self-ignorance condition, the inexpressibility condition, and the out-of-situation condition). Therefore, whenever researchers have reasons to think that *any* of these conditions obtains, the use of some alternative methodological procedure should be compelling (with the proviso that the insincerity condition *might* be effectively dealt with within the standard strategy).

Participant observation

Our candidate has for a long time been part of the methodological toolbox of the social sciences, at least among those who operate within ethnographic or interpretative approaches: participant observation. In social anthropology, where it was mainly developed, it is nowadays a must-do for any researcher who seriously sets herself to the task of understanding the beliefs, values, and practices of people (see, e.g. Hendry 1999; Bernard 2006; DeWalt and DeWalt 2010; Zahle 2013). In education, it has also been widely used (see, e.g. Erickson 1986; Eisenhart 1988), although less commonly in the study of beliefs. Still, some regularly quoted studies in that field have used, and in fact derive part of their strength from, participant observation (e.g. Lortie 1975; Jackson 1990). The very inclusion of

teachers' mental life as a central theme in the research on teaching was to a great extent due to the development of ethnographic studies (Freeman 2002).

Basically, participant observation consists in learning things by both observing and taking part in what is going on around (Fontein 2014). By joining the activities of a given group of people, researchers learn about 'the explicit and tacit aspects of their life routines and their culture' (DeWalt and DeWalt 2010, 1). The explicit aspects are those which people can articulate, whereas the tacit ones largely remain outside their consciousness. Researchers systematically record these observations (usually, but not exclusively, in writing), thereby producing a series of *thick descriptions*, that is, descriptions that capture the meaning of the observed and the web of relationships within which it is placed (Geertz 1994; Ponterotto 2006).¹

Because participant observation does not depend on people's self-reports, its credibility and accuracy is not threatened by any of the four conditions under which the standard strategy is likely to fail. Moreover, it does not bring about the out-of-situation condition, for the observation is carried out in the very situations where the relevant beliefs are usually expressed. But there are at least two other very good reasons this procedure is particularly suitable for identifying beliefs.

One is that, even though the connection between belief and action is not such that to believe something entails actually performing certain actions, it does entail the disposition to act in certain ways. This is not an empirical claim but a stronger, logical claim grounded on the very concept of belief (see, e.g. Levi and Morgenbesser 1964; Rokeach 1969; Armstrong 1973; Velleman 2000; Dennett 2004; Ryle 2009b). Thus, the possibility offered by participant observation to witness people's actions over a relatively long period of time, which is about the most reliable way there is to establish their behavioural dispositions, puts the researcher in a very good position to ascribe beliefs. (This point certainly needs elaboration, but we do not have the space for that here. We are currently working in another paper – on the definition of belief – where we devote several pages to it.)

The other reason has to do with the very intimate relation between subject and object that is required by the production of deep knowledge about beliefs and other subjective entities. In a way, the subject must *be* the object, as the French philosopher Bergson (1979) would put it. Another philosophical antecedent of this approach can be found in Herder: 'Be a shepherd with shepherds, a peasant in the midst of an agricultural people, an oriental among the primitive dwellers of the East, if you want to enjoy these creations in the atmosphere of their birth' (as quoted in Berlin 1976, 186). This is an epistemic demand that arises when the object of knowledge is part of the subjective or intersubjective world (beliefs, cultural meanings, experiences, etc.). Unlike such things as the movement of subatomic particles, chemical reactions and, more generally, the processes studied by physics and other natural sciences by means of observations which certainly require a detached, third person perspective, the social world has what Taylor (1971) calls *experiential meaning*, that is, the kind of meaning that can be fully grasped only by beings that are capable of undergoing certain experiences (see also, among many others, Jackson 1982; Nagel 1989). In this vein, Howe (2004, 50) reminds educational researchers that 'human behavior, unlike atoms and molecules, can be fully understood only from the insiders' perspective' (a relatively contemporary exposition of this conception of human behaviour and some of its epistemic consequences can be found, for example, in McDowell 1982 and Taylor 1975).

Participant observation provides researchers with this perspective by placing them as part of the phenomenon observed.² Thus, to practice this method is 'to join in correspondence with those with whom we learn or among whom we study' (Ingold 2014, 390). It is to acknowledge the fluidity and dynamism of knowledge among humans and their communities, and to conceive of it as something that 'grows and is grown in the forge of our relations with others' (391). Researchers must couple both their perception and action with the movements of others. These coupling movements answer to each other and reveal deeper aspects of practices and discourses than those accessed through merely eliciting people's reports, especially in situations divorced from real life stream.

Actually, the very motivation underlying Malinowski's introduction of participant observation into anthropology was his realization that 'there is a series of phenomena of great importance which cannot possibly be recorded by questioning or computing documents, but have to be observed in their full actuality' (Malinowski 1922, 18). He became conscious that if he wanted to really understand what the people he was studying believed, valued, aspired to, etc., he had to go beyond what they reported – he had to be with them, see the things they did and also, when possible, include himself in those practices. For only by doing this can researchers put themselves in the epistemic position required to fully understand (inter)subjective phenomena.

This epistemological outlook is well established in social anthropology, where participant observation is regarded as the 'quintessential ethnographic fieldwork method' (Bernard 2006, 342) and even 'the defining method' of the discipline (Zahle et al. 2013, 365). In education, however, not everyone is convinced about its suitability, despite the fact that, as we said, it has been widely used. There are, in particular, three qualms about it that we would like to tackle here, for they can make the standard strategy *seem* a preferable approach.

Time and cost

The first concern is pragmatic. Participant observation calls for long periods of fieldwork carried out by very well trained observers (they must be prepared to make thick descriptions in the relevant domains). All this makes it a rather expensive method, especially compared to the use of surveys, questionnaires, and their kin, which do not take too much time and, in many cases, are cheaper.

Now, we ourselves are researchers and know very well that the speed with which a study produces results can be an issue. But velocity must never outweigh validity. We also perfectly understand that researchers do not always have all of the financial resources they would need – again, we have been there ourselves. This, however, is a good reason to rethink public policies about social research, not to loosen the requirements of scientific rigour: 'if we wanted to measure temperature, we would not trade a thermometer for a stone, even if the latter is cheaper; nor should rapidity make us prefer a faulty calculator over an abacus' (Gaete 2013, 3). Scarcity of time and funding provides no justification to follow less accurate procedures. High-quality research demands the use of the most suitable methods, whether or not they can save time and money.

Put differently, any given method's being time-consuming and expensive is a downside only insofar as there is a faster, cheaper alternative procedure that is *equally valid* for producing *the sort of knowledge* the researcher is after. Otherwise, rather than a real downside what we have is the necessary cost of the right way of conducting social research on certain issues and with certain epistemological aspirations. This seems to be the case for participant observation, since as far as we can tell no theorist has ever shown that there is another as good or better way to obtain inside knowledge of people's subjective and intersubjective life.

Thus, although it is undeniable that the validity of participant observation is utterly dependent on the researchers' observation and interpretation skills, and despite the time and cost it can entail, the scientific thing to do is to make every effort to keep research pragmatically tenable *without affecting its epistemological tenability*. Participant observation is admittedly a quite demanding method, but there is no point in resorting to less demanding options if they will not provide researchers with the sort of information they are after.

Objectivity

The second qualm is epistemological. It is the idea that participant observation entails a loss in scientific objectivity. Because everything researchers see and hear is 'filtered' by their own subjectivity, it is said, their descriptions are forever prevented from acquiring the status of objective. The close relation between subject and object, the fact that the observer is part of the observed, is supposed to render the information collected by means of this approach inevitably biased.

But this is just false. Granted, the researcher will not have a *certain* kind of objectivity, namely, the kind of objectivity that logical positivism demanded from science. But it is precisely because of its controversial objectivity requirements that positivism ended up being rejected as a proper account of science (see, e.g. Leary 1985). For such requirements happened to be unattainable even in the natural sciences, as was finally acknowledged by the last twentieth century positivist philosophers themselves. Scientific objectivity is not a matter of escaping from subjectivity – which by the way is impossible for human beings – but a matter of producing a certain sort of intersubjectivity (for different versions of this core idea among epistemologists, see, e.g. Taylor 1971; Feyerabend 1978; Longino 1990; Popper 2002). The intervention of researchers' subjectivity in their observations is not a bias contaminating their descriptions but the very bedrock of any viable conception of objectivity. As Nietzsche (1967, 119) put it decades ago:

There is *only* a perspective seeing, *only* a perspective 'knowing'; and the *more* affects we allow to speak about one thing, the *more* eyes, different eyes, we can use to observe one thing, the more complete will our '*concept*' of this thing, our '*objectivity*', be.

As a scientific methodological procedure, participant observation can – and *must* – be objective in a sense, but not in the positivist sense (which makes impossible for anyone to be objective). As Brinkmann (2012, 62) has recently noted,

on many reasonable interpretations of what it means to be objective, qualitative research can indeed attain objectivity. If being objective means reflecting the nature of the object researched, letting the object speak, or being adequate to the object investigated, qualitative research seems entirely capable of being objective.

Just as 'scientifically based research' is not synonymous with 'experimental research' (Eisenhart 2006), 'objectivity' is not synonymous with 'a view from nowhere' or 'an absolute view' (see also Nagel 1989; Williams 2011). The radical, positivist opposition between the objective and the subjective has been overcome in epistemology. It is time that this important theoretical achievement in the philosophy of science be widely acknowledged in educational research.

Moreover, according to some recent developments in epistemology, the fact that researchers make themselves part of the phenomena they observe can even increase both the power and the validity of their observations. In this vein, Butterfill (2013) has argued that interacting observers can know things they could not access if they were unable to interact with the people they observe. If this line of reasoning is on the right track, there would be more reasons to think of participant observation as one of the most appropriate ways to collect information about people's beliefs.

Now of course any observation can always involve distortions and this problem will always be lurking around. But theorists have tackled it over the years and nowadays there is wide agreement that it is perfectly surmountable. After a critical review of some discussions about the objectivity of participant observation that took place in the 1940s and the 1950s (two decades in which logical positivism was still quite influential in the philosophy of science), Zahle (2013) concluded that 'most of the discussants [...] maintained that the method is reliable only if the researcher takes a whole number of precautionary measures' (365), several of which involve concerns about her preparation. It is here, indeed, that we must look if we want to keep educational research objective: we need well-prepared researchers who have a broad knowledge of epistemology as well as the skills required for conducting rigorous and systematic observations (see also Erickson 1986).

Generalization

Finally, researchers may worry that no generalizations will be ever yielded by means of participant observation. This fits well with anthropological research, since anthropologists are commonly interested less in making general claims than in the complexity and uniqueness of the particular; but is it not the case that in education we are more in need of general knowledge?

Advocates of participant observation usually answer to this criticism by reminding us that in education we are just as much concerned with the unique and the particular as we are with the common and the general (see, e.g. Erickson 1986). Moreover, getting knowledge of the particular is crucial even if one is ultimately concerned with the general, since one has to generalize *from something*.

But besides all this, it is just not true that participant observation is unhelpful to produce general knowledge. True, normally it yields no *statistical* generalization, but in the social sciences, there is a kind of generalization that proceeds not by statistical inference but by identifying the rules or principles underlying a certain activity. Thus, for instance, in order to identify the rules that the whole population of chess-players follow in playing their game, all we need to know is the rules followed by one single chess-player. The same sort of non-statistical generalization has been appealed to by philosopher Searle (1969) to spell out, by virtue of the critical observation of his own linguistic behaviour, the rules and principles all other speakers of his language usually respect. This rule identification process that allows making justified generalizations is usually, if not always, generated by the participant aspect of participant observation.³ In this vein, Harris (2012) has suggested that children's learning of language occurs by them being immersed in linguistic practices as participant observers. Of course, children do not literally engage in participant observation or any other scientific procedure, at least because their actions are not aimed to produce any kind of theory and they do not keep any systematic register of anything, but the image is insightful – it hints at the great power of participant observation to yield general knowledge too.

Concluding remarks

The virtues of participant observation should not obscure the merits of other methods and tools that can be used to capture people's beliefs and other mental states. Take, for instance, video-based interview (Alonzo and Kim 2016), learning study (Nilsson and Vikström 2015), and collaborative inquiry (Ciampa and Gallagher 2016). Under the right circumstances, all these procedures allow subjects to become aware of the beliefs underlying their actions, especially when the self-ignorance and the inexpressibility conditions obtain. They may be perfectly acceptable alternatives to participant observation, and *sometimes* they can be even more suitable.

In any case, the standard strategy must stop being the main methodological practice in the study of beliefs. Even though it might work on occasion, its failure conditions obtain too frequently and its flaws are too serious to be lightly brushed aside. There are no doubt important differences between easy-to-take paper-pencil instruments, survey software, face-to-face interviews, or any other report-based techniques, but they are all vulnerable to most of the problems we identified at the beginning of this paper.

Furthermore, considering that the research in the field has for the most part rested on the standard strategy, we should revise what we 'know' so far about the beliefs of teachers, students, and other participants in the educational process. Our suggestion is that we reinterpret the results offered by most of the studies as information about people's (explicit) discourses and not necessarily about their actual beliefs.

What is at stake here is no less than the quality of educational research. It would be a lack of scientific rigour to keep relying on a strategy that has not been adequately justified so far. Good science may do without cheap and easy-to-apply instruments, but not without validity.

Notes

1. The notion of thick description is an important contribution to contemporary epistemology made during the second half of the twentieth century by the British philosopher Ryle (2009a). It is a key notion that helped to overcome some of the unjustified obstacles that logical positivism imposed to scientific inquiry. It was Geertz (1994) who introduced it to anthropology and the social sciences.
2. For anthropologists, participating entails joining in "the current of activity in which you carry on a life alongside and together with the persons and things that capture your attention" (Ingold 2014, 387). In this vein, Hockey and

Martin (2012) assert that participant observation should be understood as participant *engagement*, which reflects the importance of both *being there* and *being with* other people. There are, of course, different ways in which researchers can participate in any given community (for there are different sorts of activities and different ways of engaging in them); and surely, these different kinds of participation provide access to different aspects of the observed phenomena. Thus, for example, some of the beliefs researchers can get knowledge of by participating as teaching assistants at school are clearly not available to them if their role is to make the coffee or to do some other non-pedagogical job. (We are thankful to the reviewers of this paper for making us state this point.)

3. Of course, there is no unique set of rules (either in chess or in any natural language) and, to that extent, there are different communities – so the knowledge acquired can be correctly generalized only to the specific community in which one has participated. This must always be considered when interpreting the results of participant observation.

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References

- Akkerman, Sanne F., and Paulien C. Meijer. 2011. "A Dialogical Approach to Conceptualizing Teacher Identity." *Teaching and Teacher Education* 27: 308–319. doi:10.1016/j.tate.2010.08.013.
- Alexander, Patricia A., and Filip J. R. C. Dochy. 1995. "Conceptions of Knowledge and Beliefs: A Comparison Across Varying Cultural and Educational Communities." *American Educational Research Journal* 32: 413–442. doi:10.3102/00028312032002413.
- Alonzo, Alicia C., and Jiwon Kim. 2016. "Declarative and Dynamic Pedagogical Content Knowledge as Elicited Through Two Video-based Interview Methods." *Journal of Research in Science Teaching* 53 (8): 1259–1286. doi:10.1002/tea.21271.
- Armstrong, David. 1973. *Truth, Belief, and Knowledge*. London: Cambridge University Press.
- Bargsted, Matias, and Orit Kedar. 2009. "Coalition-targeted Duvergerian Voting: How Expectations Affect Voter Choice Under Proportional Representation." *American Journal of Political Science* 53 (2): 307–323. doi:10.1111/j.1540-5907.2009.00372.x.
- Beghetto, Ronald A., and Juliet A. Baxter. 2012. "Exploring Student Beliefs and Understanding in Elementary Science and Mathematics." *Journal of Research in Science Teaching* 49 (7): 942–960. doi:10.1002/tea.21018.
- Bergson, Henri. 1979. *Introducción a la metafísica. La intuición filosófica* [Introduction to Metaphysics. Philosophical Intuition]. Buenos Aires: Siglo Veinte.
- Berlin, Isaiah. 1976. *Vico and Herder: Two Studies in the History of Ideas*. London: Chatto and Windus.
- Bernard, Russell. 2006. *Research Methods in Anthropology. Qualitative and Quantitative Approaches*. 4th ed. Lanham, MD: AltaMira Press.
- Bersabé, Rosa, María Jesús Fuentes, and Emma Motrico. 2001. "Análisis psicométrico de dos escalas para evaluar estilos educativos parentales [Psychometric Analysis of Two Scales to Evaluate Parents' Educational Styles]." *Psicothema* 13: 678–684. <http://www.unioviado.net/reunido/index.php/PST/article/view/7885>.
- Beswick, Kim. 2012. "Teachers' Beliefs About School Mathematics and Mathematicians' Mathematics and Their Relationship to Practice." *Educational Studies in Mathematics* 79: 127–147. doi:10.1007/s10649-011-9333-2.
- Bloch, Maurice. 1998. *How We Think They Think*. Boulder, CO: Westview Press.
- Bourdieu, Pierre. 2012. *Distinction: A Social Critique of the Judgement of Taste*. London: Routledge.
- Brinkmann, Svend. 2012. "Qualitative Research Between Craftsmanship and McDonaldization. A Keynote Address from the 17th Qualitative Health Research Conference." *Qualitative Studies* 3 (1): 56–68.
- Butterfill, Stephen. 2013. "Interacting Mindreaders." *Philosophical Studies*, 165 (3): 841–863. doi:10.1007/s11098-012-9980-x.
- Chen, Jason A, Shari Metcalf, and Shane Tutwiler. 2014. "Motivation and Beliefs About the Nature of Scientific Knowledge Within an Immersive Virtual Ecosystems Environment." *Contemporary Educational Psychology* 39 (2): 112–123. doi:10.1016/j.cedpsych.2014.02.004.
- Ciampa, Katia, and Tiffany L. Gallagher. 2016. "Teacher Collaborative Inquiry in the Context of Literacy Education: Examining the Effects on Teacher Self-Efficacy, Instructional and Assessment Practices." *Teachers and Teaching: Theory and Practice* 22 (7): 858–878. doi:10.1080/13540602.2016.1185821.

- Clark, Christopher M. 1988. "Asking the Right Questions About Teacher Preparation: Contributions of Research on Teacher Thinking." *Educational Researcher* 17 (2): 5–12. doi:10.3102/0013189X017002005.
- Confrey, Jere. 1990. "A Review of the Research on Student Conceptions in Mathematics, Science, and Programming." *Review of research in education* 16: 3–56. <http://www.jstor.org/stable/1167350>.
- De Groot, Elisabeth V. 2002. "Learning Through Interviewing: Students and Teachers Talk About Learning and Schooling." *Educational Psychologist* 37 (1): 41–52.
- Dennett, Daniel. 2004. "Three Kinds of Intentional Psychology." In *Philosophy of Mind: A Guide and Anthology*, edited by John Heil, 299–320. New York: Oxford University Press.
- Denzin, Norman K. 2009. "The Elephant in the Living Room: Or Extending the Conversation About the Politics of Evidence." *Qualitative Research* 9 (2): 139–160. doi:10.1177/1468794108098034.
- DeWalt, Kathleen, and Billie DeWalt. 2010. *Participant Observation: A Guide for Fieldworkers*. 2nd ed. Lanham, Maryland: AltaMira Press.
- Drummond, Kathryn V., and Deborah Stipek. 2004. "Low-Income Parents' Beliefs About Their Role in Children's Academic Learning." *The Elementary School Journal* 104 (3): 197–213.
- Eisenhart, Margaret A. 1988. "The Ethnographic Research Tradition and Mathematics Education Research." *Journal for Research in Mathematics Education* 19 (2): 99–114.
- Eisenhart, Margaret. 2006. "Qualitative Science in Experimental Time." *International Journal of Qualitative Studies in Education* 19: 697–707. doi:10.1080/09518390600975826.
- Erickson, Frederick. 1986. "Qualitative Methods in Research on Teaching." In *Handbook of Research on Teaching*. 3rd ed., edited by Merlin Wittrock and American Research Association, 119–161. New York: Macmillan.
- Fang, Zhihui. 1996. "A Review of Research on Teacher Beliefs and Practices." *Educational Research* 38 (1): 47–65. doi:10.1080/0013188960380104.
- Farrell, Thomas SC, and Jessica Ives. 2015. "Exploring Teacher Beliefs and Classroom Practices Through Reflective Practice: A Case Study." *Language Teaching Research* 19: 594–610. doi:10.1177/1362168814541722.
- Feyerabend, Paul. 1978. *Science in a Free Society*. London: New Left Books.
- Fontein, Joost. 2014. "Doing Research. Fieldwork Practicalities." In *Doing Anthropological Research. A Practical Guide*, edited by Natalie Konopinski, 70–90. London: Routledge.
- Freeman, Donald. 2002. "The Hidden Side of the Work: Teacher Knowledge and Learning to Teach. A Perspective from North American Educational Research on Teacher Education in English Language Teaching." *Language Teaching* 35 (1): 1–13. doi:10.1017/S0261444801001720.
- Gaete, Alfredo. 2013. "Teacher Beliefs and Belief Reports: Why the Difference Really Matters." *Proceedings of the 5th International Conference on Education and New Learning Technologies – EDULEARN13*.
- Gaete, Alfredo, and Cristián Ayala. 2015. "Enseñanza Básica en Chile: Las Escuelas que Queremos [Primary Education in Chile: The Schools We Want]." *Revista Calidad en la Educación* 42: 17–59.
- Gaete, Alfredo, and Joaquín Gaete. 2015. "On Theoretical Integration in Psychotherapy." *Journal of Psychotherapy Integration* 25 (2): 158–174.
- Geertz, Clifford. 1994. "Thick Description: Toward an Interpretive Theory of Culture." In *Readings in the Philosophy of Social Science*, edited by Michael Martin and Lee McIntyre, 213–231. Palo Alto, CA: MIT Press.
- Genishi, Celia, Sharon Ryan, Mindy Blaise, and Mary Yarnall. 2001. "Teaching in Early Childhood Education: Understanding Practices Through Research and Theory." In *Handbook of Research on Teaching*, 4th ed., edited by Virginia Richardson, 1175–1210. Washington, DC: American Education Research Association.
- Giroux, Henry A., and Anthony N. Penna. 1979. "Social Education in the Classroom: The Dynamics of the Hidden Curriculum." *Theory & Research in Social Education* 7 (1): 21–42.
- Haeffel, Gerald J., and George S. Howard. 2010. "Self-Report: Psychology's Four-Letter Word." *American Journal of Psychology* 123 (2): 181–188. doi:10.5406/amerjpsyc.123.2.0181.
- Halldén, Ola, Liza Haglund, and Helge Strömdahl. 2007. "Conceptions and Contexts: On the Interpretation of Interview and Observational Data." *Educational Psychologist* 42: 25–40. doi:10.1080/00461520709336916.
- Harris, Paul. 2012. *Trusting What You're Told: How Children Learn From Others*. Cambridge: The Belknap Press/Harvard University Press.
- Hayes, Andrew, Carroll Glynn, and James Shanahan. 2005. "Validating the Willingness to Self-Censor Scale: Individual Differences in the Effect of the Climate of Opinion on Opinion Expression." *International Journal of Public Opinion Research* 17 (4): 443–455. doi:10.1093/ijpor/edh072.
- Hendry, Joy. 1999. *An Introduction to Social Anthropology. Other People's Worlds*. New York: Palgrave.
- Herron, Julie. 2010. "An Evolution of Mathematical Beliefs: A Case Study of Three Pre-K Teachers." *Journal of Early Childhood Teacher Education* 31 (4): 360–372. doi:10.1080/10901027.2010.523771.
- Hockey, Jenny, and Martin Forsey. 2012. "'Ethnography Is Not Participant Observation: Reflections on the Interview as Participatory Qualitative Research.'" In *The Interview. An Ethnographic Approach (ASA Monographs 49)*, edited by Jonathan Skinner, 69–88. London: Berg.
- Hofer, Barbara K., and Paul R. Pintrich. 1997. "The Development of Epistemological Theories: Beliefs About Knowledge and Knowing and Their Relation to Learning." *Review of Educational Research* 67: 88–140. doi:10.3102/00346543067001088.

- Hoffman, Bobby H., and Katrin Seidel. 2015. "Measuring Teachers' Beliefs. For What Purpose?" In *International Handbook of Research on Teachers' Beliefs*, edited by Helenrose Fives and Michele Gregoire Gill, 106–127. New York: Routledge.
- Holden, George W., and Lee A. Edwards. 1989. "Parental Attitudes Toward Child Rearing: Instruments, Issues, And Implications." *Psychological Bulletin* 106 (1): 29–58. doi:10.1037/0033-2909.106.1.29.
- Hornstra, Lisette, Linda Van den Bergh, and Eddie Denessen. 2011. "Implicit Measures of Prejudiced Attitudes of Teachers." *Pedagogische Studien* 88 (5): 354–366.
- Horwitz, Elaine K. 1999. "Cultural and Situational Influences on Foreign Language Learners' Beliefs About Language Learning: A Review of BALLI Studies." *System* 27 (4): 557–576. doi:10.1016/S0346-251X(99)00050-0.
- Hoskins, Sally G., David Lopatto, and Leslie M. Stevens. 2011. "The C.R.E.A.T.E. Approach To Primary Literature Shifts Undergraduates' Self-assessed Ability To Read And Analyze Journal Articles, Attitudes About Science, And Epistemological Beliefs." *Cell Biology Education* 10 (4): 368–378. doi:10.1187/cbe.11-03-0027.
- Howe, Kenneth R. 2004. "A Critique of Experimentalism." *Qualitative Inquiry* 10 (1): 42–61. doi:10.1177/1077800403259491.
- Hoyles, Celia. 1992. "Mathematics Teaching and Mathematics Teachers: A Meta-case Study." *For the Learning of Mathematics* 12 (3): 32–44. <http://flm-journal.org/Articles/1DE037F8DB5D7C1A8E314F7D172176.pdf>.
- Ingold, Tim. 2014. "That's Enough About Ethnography!" *Hau: Journal of Ethnographic Theory* 4 (1): 383–395.
- Jackson, Frank. 1982. "Epiphenomenal Qualia." *The Philosophical Quarterly* 32 (127): 127–136.
- Jackson, Philip. 1990. *Life in Classrooms*. New York: Teachers College Press.
- Johnson, T. P., M. Fendrich, and A. Hubbell. 2002. "A Validation of the Crowne-Marlowe Social Desirability Scale." Paper presented at the 57th Annual Meeting of the American Association for Public Opinion Research, St. Petersburg, FL, May, 1661–1666.
- Kagan, Dona M. 1992. "Implication of Research on Teacher Belief." *Educational Psychologist* 27: 65–90. doi:10.1207/s15326985ep2701_6.
- Kane, Ruth, Susan Sandretto, and Chris Heath. 2002. "Telling Half the Story: A Critical Review of Research on the Teaching Beliefs and Practices of University Academics." *Review of Educational Research* 72: 177–228. doi:10.3102/00346543072002177.
- Karmiloff-Smith, Anette. 1992. *Más allá de la modularidad* [Beyond Modularity]. Madrid: Alianza.
- Koskey, Kristin L.K., Stuart A. Karabenick, Michael E. Woolley, Christina R. Bonney, and Bridget V. Dever. 2010. "Cognitive Validity of Students' Self-Reports of Classroom Mastery Goal Structure: What Students Are Thinking and Why It Matters." *Contemporary Educational Psychology* 35: 254–263. doi:10.1016/j.cedpsych.2010.05.004.
- Leary, David E. 1985. "The Cult of Empiricism in Psychology, and Beyond." In *A Century of Psychology as Science*, edited by Sigmund Koch and David E. Leary, 594–617. New York: McGraw-Hill.
- Leatham, Keith. 2006. "Viewing Mathematics Teachers' Beliefs as Sensible Systems." *Journal of Mathematics Teacher Education* 9 (1): 91–102.
- Levi, Isaac, and Sidney Morgenbesser. 1964. "Belief and Disposition." *American Philosophical Quarterly* 1: 221–232. doi:10.1007/978-94-017-1282-8_21.
- Lewkowicz, Sergio, and Thierry Bokanowski. 2011. *On Freud's 'Constructions in Analysis'*. London: Karnac.
- Longino, Helen. 1990. *Science as Social Knowledge: Values and Objectivity in Scientific Inquiry*. Princeton, NJ: Princeton University Press.
- Lortie, Dan. 1975. *Schoolteacher: A Sociological Inquiry*. Chicago, IL: University of Chicago Press.
- Maggioni, Liliana, Bruce VanSledright, and Patricia A. Alexander. 2009. "Walking on the Borders: A Measure of Epistemic Cognition in History." *Journal of Experimental Education* 77: 187–214. doi:10.3200/JEXE.77.3.187-214.
- Mägi, Katrin, Marja-Kristiina Lerkkanen, Anna-Maija Poikkeus, Helena Rasku-Puttonen, and Jari-Erik Nurmi. 2011. "The Cross-Lagged Relations Between Children's Academic Skill Development, Task-avoidance, And Parental Beliefs About Success." *Learning and Instruction* 21 (5): 664–675. doi:10.1016/j.learninstruc.2011.03.001.
- Malinowski, Bronislaw. 1922. *Argonauts of the Western Pacific*. London: Routledge and Kegan Paul.
- Marcos, Juan José Mena, and Harm Tillema. 2006. "Studying Studies on Teacher Reflection and Action: An Appraisal of Research Contributions." *Educational Research Review* 1 (2): 112–132. doi:10.1016/j.edurev.2006.08.003.
- Martín, Elena, Juan Ignacio Pozo, Mar Mateos, Ana Martín, and María del Puy Pérez Echeverría. 2014. "Infant, Primary and Secondary Teachers' Conceptions of Learning and Teaching and Their Relation to Educational Variables." *Revista Latinoamericana de Psicología* 46: 211–221.
- McDowell, John. 1982. "Criteria, Defeasibility, and Knowledge." *Proceedings of the British Academy London* 68: 455–479.
- McKeachie, Willbet J., Yi-Guang Lin, and James Strayer. 2002. "Creationist vs. Evolutionary Beliefs: Effects on Learning Biology." *The American Biology Teacher* 64 (3): 189–192.
- Morris, Mary Beth. 2011. "Teacher and Principal Beliefs about Principal Leadership Behaviour." (PhD diss.). The University of Southern Mississippi.
- Muis, Krista. 2004. "Personal Epistemology and Mathematics: A Critical Review and Synthesis of Research." *Review of Educational Research* 74 (3): 317–377. doi:10.3102/00346543074003317.
- Nagel, Thomas. 1989. *The View from Nowhere*. Oxford: Oxford University Press.
- Nespor, Jan. 1987. "The Role of Beliefs in the Practice of Teaching." *Journal of Curriculum Studies* 19 (4): 317–328. doi:10.1080/0022027870190403.

- Nietzsche, Friedrich. 1967. *The Genealogy of Morals*. New York: Random House.
- Nilsson, Pernilla, and Anna Vikström. 2015. "Making PCK Explicit – Capturing Science Teachers' Pedagogical Content Knowledge (PCK) in the Science Classroom." *International Journal of Science Education* 37 (17): 2836–2857. doi:10.1080/09500693.2015.1106614.
- Nisbett, Richard E., and Timothy D. Wilson. 1977. "Telling More Than We Can Know: Verbal Reports on Mental Processes." *Psychological Review* 84 (3): 231–259. doi:10.1037/0033-295X.84.3.231.
- Pajares, M. Frank. 1992. "Teachers' Beliefs and Educational Research: Cleaning up a Messy Construct." *Review of Educational Research* 62: 307–332.
- Piaget, Jean. 1951. *The Child's Conception of the World*. Lanham, MD: Littlefield Adams.
- Polanyi, Michael. 1961. "II. – Knowing and Being." *Mind* LXX (280): 458–470.
- Ponterotto, Joseph. 2006. "Brief Note on the Origins, Evolution, and Meaning of the Qualitative Research Concept 'Thick Description.'" *The Qualitative Report* 11 (3): 538–549. <http://nsuworks.nova.edu/tqr/vol11/iss3/6>.
- Popper, Karl. 2002. *The Logic of Scientific Discovery*. London: Routledge.
- Price, Vincent, and Scott Allen. 1990. "Opinion Spirals, Silent and Otherwise: Applying Small-group Research to Public Opinion Phenomena." *Communication Research* 17: 369–392. doi:10.1177/009365090017003005.
- Ray, John J. 1983. "Reviving the Problem of Acquiescent Response Bias." *The Journal of Social Psychology* 121 (1): 81–96. doi:10.1080/00224545.1983.9924470.
- Rokeach, Milton. 1969. *Beliefs, Attitudes, and Values: A Theory of Organization and Change*. San Francisco, CA: Josey-Bass.
- Rudolph, John. 2014. "Why Understanding Science Matters: The IES Research Guidelines as a Case in Point." *Educational Researcher* 43 (1): 15–18.
- Ryle, Gilbert. 2009a. *Collected Essays 1929–1968*. Oxon: Routledge.
- Ryle, Gilbert. 2009b. *The Concept of Mind*. Oxon: Routledge.
- Schultz, Jan, Roger Säljö, and Jan Wyndhamn. 2001. "Heavenly Talk: Discourse, Artifacts, and Children's Understanding of Elementary Astronomy." *Human Development* 44 (2–3): 103–118. doi:10.1159/000057050.
- Searle, John. 1969. *Speech Acts: An Essay in the Philosophy of Language*. Cambridge, UK: Cambridge University Press.
- Skott, Jeppe. 2015. "The Promises, Problems, and Prospects of Research on Teachers' Beliefs." In *International Handbook of Research on Teachers' Beliefs*, edited by Helenrose Fives and Michele Gregoire Gill, 13–30. New York: Routledge.
- Smith, Marvin E., Susan L. Swars, Stephanie Z. Smith, and Lynn C. Hart. 2012. "Effects of an Additional Mathematics Content Course on Elementary Teachers' Mathematical Belief and Knowledge for Teaching." *Action in Teacher Education* 34 (4): 336–348. doi:10.1080/01626620.2012.712745.
- Sneider, Gary, and Steven Pulos. 1983. "Children's Cosmographies: Understanding the Earth's Shape and Gravity." *Science Education* 67 (2): 205–221. doi:10.1002/sce.3730670209.
- Southerland, Sherry A., Vivian L. Gadsden, and Carolyn D. Herrington. 2014. "Editors' Introduction: What Should Count as Quality Education Research? Continuing the Discussion." *Educational Researcher* 43 (1): 7–8.
- Speer, Natasha M. 2005. "Issues of Methods and Theory in the Study of Mathematics Teachers' Professed and Attributed Beliefs." *Educational Studies in Mathematics* 58 (3): 361–391. doi:10.1007/s10649-005-2745-0.
- Taylor, Charles. 1971. "Interpretation and the Sciences of Man." *The Review of Metaphysics* 25 (1): 3–51.
- Taylor, Charles. 1975. *Hegel*. Cambridge: Cambridge University Press.
- Trumbull, Deborah J. 1990. "Evolving Conceptions of Teaching: Reflections of One Teacher." *Curriculum Inquiry* 20 (2): 161–182. doi:10.1080/03626784.1990.11076071.
- Tversky, Amos, and Daniel Kahneman. 1974. "Judgement Under Uncertainty: Heuristics and Biases." *Science* 185 (4157): 1124–1131. doi:10.1126/science.185.4157.1124.
- Veal, William R. 2004. "Beliefs and Knowledge in Chemistry Teacher Development." *International Journal of Science Education* 26 (3): 329–351. doi:10.1080/0950069032000097389.
- Velleman, David. 2000. *The Possibility of Practical Reason*. Oxford: Oxford University Press.
- Wideen, Marvin, Jolie Mayer-Smith, and Barbara Moon. 1998. "A Critical Analysis of the Research on Learning to Teach: Making the Case for an Ecological Perspective on Inquiry." *Review of Educational Research* 68: 130–178. doi:10.3102/00346543068002130.
- Wieman, Carl E. 2014. "The Similarities Between Research in Education and Research in the Hard Sciences." *Educational Researcher* 43 (1): 12–14.
- Williams, Bernard. 2011. *Ethics and the Limits of Philosophy*. London: Routledge.
- Wittrock, Merlin. 1996. "Students' Thought Processes." In *Handbook of Research on Teaching*, 3rd ed., edited by Merlin Wittrock, 297–314. New York: Macmillan.
- Youngs, Peter. 2007. "How Elementary Principals' Beliefs and Actions Influence New Teachers Experiences." *Educational Administration Quarterly* 43: 101–137. doi:10.1177/0013161X06293629.
- Zahle, July. 2013. "Participant Observation and Objectivity in Anthropology." In *New Challenges to Philosophy of Science*, edited by Hanne Andersen, Dennis Dieks, Wenceslao González, Thomas Uebel, and Gregory Wheeler, 365–376. Dordrecht: Springer.