

***Absence and Presence in Science: Critical Reply to the Special Issue on ‘Absences’***  
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**Introduction**

With this critical reply, I am pleased to engage in conversation with *Social Epistemology*'s special issue on '[Absences](#).' More specifically, I engage in conversation on absences in science and its ensemble of epistemic (cf., knowledge and ignorance) practices with Jennifer Croissant ([2014](#)) and Scott Frickel's ([2014](#)) contributions.

Before I launch into the reply, however, I clarify my starting point. Here, I do not take what I deem to be a mostly Eurocentric view that technology can always be conflated with science (cf., technoscience). I avoid this view because in Canada, for example, engineers do not hold the same educational training as engineers in Europe where engineer researcher educational credentials can be closer to those of scientists in the natural sciences. I advance that the absence of a technical/scientific education and practices distinction has sometimes led social scientists to conflate risk and epistemic issues and conflate the roles of engineers and scientists (where engineers mainly focus on risk and scientists typically focus on epistemic dynamics).<sup>1</sup> Although I do not tackle the confluences per se, I do so implicitly by focussing squarely on scientists and science practices. By extension, this means that empirical research into absences should take account of contextual actor education when constructing practices as scientific or technological.

The critical reply is organized in two parts. First, I enter into conversation with Jennifer Croissant (2014) on absence and ignorance in science. In this part, I look at the valuation of ignorance by scientists themselves where ignorance not considered for valuation within science can be framed as absence. Second, I bring Céline-Marie Pascale ([2011](#)) into conversation with Scott Frickel's (2014) challenge to develop methodological approaches for the empirical study of absence. In the two parts, I draw from my theoretical and empirical research on knowledge and ignorance mobilization ([Gaudet 2013](#)), from my historical, theoretical, and empirical doctoral research on the (re)production of ignorance in journal editorial peer review, and my participation in conversations in the sociology of ignorance epistemic community. In concluding remarks, I highlight the importance of the special issue in valuing absences.

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<sup>1</sup> Exceptions in science are closely linked with applied research in the public realm (cf., health and environmentally-related research with potential impact on population health) and public science, including regulatory science and medical science actors that engage in risk-related practices and discourse. In addition to distinguishing between engineering and science education, it is important to bring attention to medical researcher education. The latter actors with educational training in applied settings tend to primarily engage in knowledge mobilization with a goal to apply knowledge (cf., applied research) much like engineers.

## **Valuation of Ignorance in an Emic Perspective**

In this first part, I enter into conversation with Jennifer Croissant (2014) on ignorance in science. I start by framing the discussion with historical insights and understanding of ignorance by scientists themselves. I then introduce a model of knowledge and ignorance mobilization dynamics (Gaudet 2013). Following the framing, I converse with Jennifer Croissant's (2014) contribution by expanding on three elements in her text.

I begin with historical framing. Scientists have increasingly valued and explicitly engaged scientific knowledge with ignorance at least since the split of natural philosophy into speculative natural philosophy and rising experimental natural philosophy in the seventeenth century (see Anstey 2005). Experiments led to the construction of new ignorance, which led to further experiments. Relations through which scientists validated scientific knowledge and ignorance also changed. New relations were reflected in the construction of the scientific journal format of exchange (with short papers and increased frequency of publication) and in journal peer review (with new relations, such as author-editor) (see Zuckerman and Merton 1971). These epistemic relations and validation dynamics have persisted through to today.

An example of contemporary scientists acknowledging ignorance and epistemic mobilization dynamics is the construction and use of 'Effective Theories' by physicists (Wells 2012). A theory can only be effective, according to Wells (2012), if it is explicitly incomplete (2012, 1). The use of 'effective' in the designation of theories, instead of only 'theories', Wells (2012) explained, "...force[s] us to confront a theory's flaws, its incompleteness, and its domain of applicability as an integral part of the theory enterprise" (2012, 1). He explored the 'theory enterprise' in physics as the accumulation of knowledge (and ignorance) from a first example of an effective theory in Galileo's law of falling bodies to contemporary examples including the Higgs boson mass. Knowledge and ignorance dynamics play a prominent role in Effective Theories where early adherents to such theories were framed as "...curiously keen on celebrating their ignorance" (2012, v) in contrast to physicists who then espoused an approach that favoured the construction of Theories of Everything (2012, v). Cultural practices of Effective Theories appear to have contributed to the reconstruction of meanings physicists give to ignorance and theories. In effect, "[t]oday, the culture and language of Effective Theories have permeated all of physics. It is not controversial and not lamentable" (2012, v). Viewed through Effective Theories in physics, ignorance is thus explicit and overtly valued.

From an emic perspective therefore, the dynamic and explicit interaction between scientific knowledge and ignorance and related validation practices (cf., peer review) constructs ignorance as valuable and as 'presence'. By emic, I mean ignorance and knowledge as self-understood by actors or in this case natural scientists in the seventeenth century through to contemporary scientists. Etic in contrast refers to theoretical or 'imposed' understanding from outside actors, such as social scientists.

Scientific ignorance from natural scientists' perspective thus appears constructed as non-pejorative and holds a meaning of driver for science (see Firestein 2012; Gaudet 2012; Duncan and Weston-Smith, 1978).

Moreover, building on Matthias Gross (2010), I define scientific ignorance as the limits and the borders of knowing in science (Gaudet 2013) and propose a model of knowledge and ignorance mobilization dynamics (2013, 11). In the model are two sub-types of ignorance. First, active non-knowledge refers to "...the limits and the borders of knowing that are intentionally or unintentionally taken into account for immediate or future planning, theorizing and action" in science (Gaudet 2013, 5). Active non-knowledge is thus presence in science. Second, latent non-knowledge refers to "...the limits and the borders of knowing [that] are intentionally or unintentionally not taken into account for immediate or future planning, theorizing and action" in science (Gaudet 2013, 5). Latent non-knowledge, contrary to active non-knowledge, is thus absence in science although it holds the potential to be mobilized into active non-knowledge and presence. Finally, I advance the concept of ignorance mobilization as complementary to that of knowledge mobilization. Respectively, I understand these as the use of knowledge or ignorance towards the achievement of goals such as social, cultural, political, professional, and economic goals (Gaudet 2013, 3).

I enlist the above historical insights, epistemic dynamics model, and definitions to help expand on three elements in Jennifer Croissant's (2014) contribution. First, she proposed that "...as outlined by many scholars, certain kinds of ignorance are the after-effects of knowledge processes, including the identification of known-unknowns and future work" (2014, 7). Here I see a need to expand and specify emic and etic understandings of ignorance. For example, ontologically, from an emic positivist realist perspective, knowledge and ignorance are typically understood as being 'out there', waiting to be captured as data.<sup>2</sup> From an etic social scientist's perspective in contrast, ontologically, ignorance is generally understood as constructed. This includes the construction of latent non-knowledge that is absent in science. Ignorance as an 'after-effect' of knowledge practices therefore reflects emic *and* etic understandings. Ontologically, in contrast, emic and etic understandings differ as proposed above.

Second, I expand on Jennifer Croissant's (2014) proposition that "[t]he question of the ontology of ignorance thus requires clarification as to a specific agnoses's relationality and epistemological features: someone somewhere knows something, someone elsewhere does not. Someone knows there is something to be known" (Croissant 2014, 7). In keeping with Jennifer Croissant (2014), Céline-Marie Pascale (2011, 144), and Pierpaolo Donati (2013, 172) it is imperative that a sociological study of knowledge (and thus ignorance) focuses on relations. The focus must therefore clearly move away from a Cartesian framework of individualistic epistemology (Pascale 2011, 144) as it might be

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<sup>2</sup> I refine this statement based on my doctoral research. There appear to be mutations in natural scientists' ontological understanding of knowledge and ignorance towards a more contextual and social construction ontology. The mutations are reflected in changing journal editorial peer review practices.

perceived in Jennifer Croissant's (2014) text above. The focus moves towards relations among actors engaging in knowledge and ignorance mobilization – such as practices to construct (cf., through scientific exchange in laboratories, in social networks) and validate knowledge and ignorance (cf., through informal and journal editorial peer review).

An example is Augustine Brannigan's (1981) argument "...that events are discoveries not by virtue of how they appear in the mind, but how they are defined in and by a cultural criterion" (1981, 90). In this relational view, scientific ignorance is not objects of study in and of itself; it is an object through relations. An important nuance Peter Wehling (2006) brings to the conversation is a need to understand knowledge beyond that of a "possession" by individual knowers. Rather, knowledge can be attributed to an individual competent knower on condition that the competent knower engages in situated relational epistemic practices (2006, 87).

Finally third, I expand on Jennifer Croissant's (2014) proposal that "[r]elational ignorances can be matters of [...] knowledge that is available in one realm of social action, but absent in another, whether by intention or not" (2014, 7). In the model of knowledge and ignorance mobilization dynamics I proposed (Gaudet 2013, 11), latent non-knowledge that fails to be mobilized by scientists can remain latent or can eventually be mobilized into active non-knowledge. These relations can operate through an insider/outsider cleavage when the latent non-knowledge is constructed outside of science. As such therefore, ignorance as latent non-knowledge can maintain an absence within science's ensemble of epistemic practices and simultaneously entertain a presence outside of science. The inside of science/outside of science absence and presence highlight relational boundaries for science as culture.

Maria Puigde la Bellacasa (2014) proposed an example of the outsider/insider cleavage operating to differentiate between what science retains as active non-knowledge within its dominant way of knowing and latent non-knowledge in another way of knowing. She advanced that "[w]hat is mostly challenged here is not science per se, but rather scientific approaches that support industrial and intensive ways of knowing and treating the soil. The absent made present is soil-as-living, a relational entity of which humans are part" (Puigde la Bellacasa 2014, 27). The absent here was outside of science's epistemic practices – therefore absent within science, but present in another way of knowing. From mostly theoretical considerations, in the next part I explore the intersection of theoretical and methodological considerations.

### **Methodological Considerations of Absence**

In this second part, I focus on Scott Frickel's (2014) contribution. He challenged social scientists to develop methodological approaches for the empirical study of absence. In order to address the challenge, he proposed ten methodological considerations. I enter Céline-Marie Pascale (2011) into dialogue with Scott Frickel's (2014) contribution.

Céline-Marie Pascale (2011) also broached difficulties in investigating the ‘presence of absence’ as “...what is not said and who is not present in a localized context” (2011, 145). Moreover, having myself grappled with some of the methodological considerations Scott Frickel (2014) proposed, I expand on two elements in his work. Firstly, I explore absence and the use of social network analysis (SNA). Secondly, I explore Scott’s Frickel’s methodological consideration to expand causal analysis.

First, I broach the use of SNA and absence. Absence as an invisible ontological entity – such as an actor type absent from a localized context (Pascale 2011, 14) – should be understood as no less a serious object of study than the invisible social relation in relational sociology (see latter in Crossley 2011, 13). In addition, as Scott Frickel (2014) suggested, one of the ways to investigate the object of study is through the measurement of relations of absences. I advance that this can be accomplished at least in part through SNA. In the SNA of a basic research laboratory ego network (where the ego was the principal investigator), for example, the *absence* of commercial and economic actors in the network was theoretically relevant (related in Gaudet et al. 2012). The absence was corroborated by co-constructed knowledge from semi-structured interviews with laboratory actors.

In the above SNA example, the absence I investigated was not owing to relations of power. If this had been the case, however, Marie-Claude Pascale (2011) warned that “[b]y normalizing localized contexts that exclude, researchers perpetuate and ingrain a naturalistic view of historical relations of power” (2011, 145). In science, this might be relevant with respect to the gender-related or race-related absences. This places an onus on social scientists to not perpetuate relations of power and to remain reflexive on absence. SNA, I believe, can help empirically capture ‘relations of absences’ as proposed by Scott Frickel (2014).

A second element I tend to in Scott Frickel’s (2014) work is a need to expand causal analysis. He proposed that “[c]ausal arguments will deepen understanding of the structural conditions that bring about absences, specific mechanisms through which absences are produced, and patterns of similarity and difference that emerge across cases” (2014, 89). Here, I first problematize the pre-construction of objects of study much like Durkheim ([1894]1988) proposed sociologists be wary of *prénotions* – summative and schematic representations we make of objects of study that surround us (also see constructing the object in Bourdieu et al. 1968, 59-83). Pre-construction can lead researchers to reify the object of study (Lopez 2009, 30) instead of contributing to its understanding. Once institutionalized, it is perhaps even more difficult to ‘see’ an object and to ‘see’ how it was shaped and is maintained by relations of power (related in Lips 1991, 11).

Furthermore, in keeping with Durkheim ([1894]1988), to understand an object of study sociologically is not only to study what role it plays or its function ([1894]1988, 182-184). For Durkheim, determining an object of study’s function is not to propose an

explanation of “...comment [l’object] est né ni comment il est ce qu’il est” ([1894]1988, 183).<sup>3</sup> As Scott Frickel (2014) proposed therefore, research that purports to contribute to theoretical understanding of absence must thus tend to ‘why’ (the what for) and ‘how’ (the because of its shaping) of absence (see elements of theory in Donati 2011, 215). Focussing on relations as fundamental entities that construct the object (Durkheim, [1894]1988, 195), understanding for absence must look to the relational development of the object in context – historically and spatially ([1894]1988, 227). In sum, social scientists must tend to “...its history, identifying the various contingent events, actions and consequences of actions (both intended and unintended) that gave rise to it” (inspired from Durkheim ([1894]1988) in Crossley 2011, 8). For example, in his critical study of bioethics, Lopez (2004) drew on Durkheim to argue that sociologists “...should reflect on the wider social and historical conditions of the emergence of ethics as an object” (2004, 891) beyond discourse.

In an example from my doctoral work, I performed historical and contemporary causal analysis to understand the shaping of my object of study – ignorance (re)production in journal editorial peer review. Using analytic induction (Pascale 2011) in a particular analysis, absences across twenty-five of the twenty-six cases helped me construct several inter-related theoretical insights on ignorance (re)production in journal editorial peer review. As advanced by Scott Frickel (2014) multiple cases are paramount to gaining insight into several contexts for an object of study (also see Pascale 2011, 55).

Finally, as Scott Frickel (2014) cautioned, it is only through sustained and modest reflexive awareness that social scientists can intentionally hope to construct the least amount of potentially new absences during the research process. I conclude this reply with a few remarks.

### **Concluding Remarks**

I believe that the *Social Epistemology* special issue and continued conversations in critical replies play important roles to help advance theoretical and empirical understandings of absence as object of study in sociology. Contributors in the special issue corroborated that absence as an invisible ontological entity can be a serious object of study much like the invisible social relation in relational sociology (see latter in Crossley 2011, 13). I will look forward to the continued presence of absence as a sociological object of study and object of conversation.

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<sup>3</sup> My translation: “...how an object was born nor how it is what it is”.

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