

## EPISTEMIC AUTONOMY & GROUP KNOWLEDGE (preproduction draft)

Chris Dragos  
Ryerson University  
idragos@ryerson.ca  
chrisdragos.com

### Abstract

I connect two increasingly popular ideas in social epistemology—*group knowledge* and *epistemic extension*—both departures from mainstream epistemological tradition. In doing so, I generate a framework for conceptualizing and organizing contemporary epistemology along several core axes. This, in turn, allows me to delineate a largely unexplored frontier in group epistemology. The bulk of extant work in group epistemology can be dubbed *intra-group epistemology*: the study of epistemically salient happenings *within* groups. I delineate and attempt to motivate what I dub *inter-group epistemology*: the study of epistemically salient happenings *between* groups and other subjects and entities.

### Introduction

In this paper, I connect two increasingly popular ideas in social epistemology, both departures from mainstream epistemological tradition. The first is *group knowledge*, by which I mean a group subject *qua* group possesses knowledge. This first idea is opposed to the traditional tenet that only individuals can possess knowledge.<sup>1</sup> The second idea central to this paper is less straightforward. I call it *epistemic extension*, the idea that a subject can possess knowledge when other subjects possess some of the *epistemic materials* (e.g. evidence held, deliberations undertaken, inferences drawn, cognitive abilities exercised) generating it. This second idea is opposed to the traditional tenet I call *epistemic autonomy*, according to which the possession of knowledge entails possession of all the epistemic materials generating it.<sup>2</sup>

How the ideas of group knowledge and epistemic extension are related remains largely unexplored by epistemologists. Connecting them allows me to generate a framework

for conceptualizing and organizing contemporary epistemology along several core axes. I present this framework in section 2. Section 3 is more forward-looking. The bulk of extant work in group epistemology studies epistemically salient happenings within groups, and so can be dubbed *intra*-group epistemology. In section 3, I delineate and attempt to motivate what I dub *inter*-group epistemology: the study of epistemically salient happenings between groups and other subjects and entities.

### 1. Epistemic Extension

The diverse accounts predicated upon or entailing epistemic extension were formulated independently and without a common label like “epistemic extension.” So, it is not immediately obvious that they are all linked by the same underlying principle—i.e. that their proponents are all *extensionists*. Given this, and given there is no survey in the literature, I begin this paper with a brief survey of epistemic extension.

Extensionists argue that knowledge bearers can be epistemically dependent in a more radical way than is traditionally permitted in epistemology, even after the externalist and social turns. A central disagreement between internalists and externalists is about what counts as an epistemic material—about whether some epistemic materials are things other than states or exercises of the subject’s inner life. Epistemic extension is more directly concerned with who possesses these materials. Since it invokes epistemic materials not possessed by the knowledge bearer, it entails externalism. However, many externalists stop short of becoming extensionists. This is because many externalists maintain that all epistemic materials generating knowledge, including the non-mental states externalists permit, are possessed by the knowledge bearer. They retain the claim that epistemic autonomy is necessary for possessing knowledge. In response to several famous problems, many externalists retreated to the confines of the individual subject’s cognitive apparatus.

According to agent reliabilism, for example, epistemic materials are confined to the individual subject's cognitive processes (or dispositions). Proponents of more recent causal accounts tend to take all salient causes to be constitutive of the individual subject's cognitive apparatus.<sup>3</sup> The common position among epistemologists, including the bulk of externalists, is that cognitive operations of others involved in an individual *S* coming to know that *p* are not epistemic materials. Instead, knowledge possession entails the possession of all epistemic materials. That is, epistemic autonomy is necessary for possessing knowledge.<sup>4</sup>

Thus, there are really two kinds of externalism at play: one according to which the individual subject's external states can constitute epistemic materials, and another according to which some epistemic materials cannot be attributed to the individual. The latter is epistemic extension. Alvin Goldman, whose work has been central for both the externalist and social turns in epistemology, indirectly helps clarify this distinction:

A justified belief is, roughly speaking, one that results from cognitive operations that are generally speaking, good or successful. But "cognitive" operations are most plausibly construed as operations of the cognitive faculties, i.e., "information-processing" equipment internal to the organism. (1979, 187)

What Goldman expresses up to "i.e." involves a claim about what sorts of things count as epistemic materials: cognitive operations. What follows "i.e." suggests two further constraints. The first rules out the cognitive operations of others; it rules out epistemic extension in favour of epistemic autonomy. The second is that epistemic subjects are individuals; it rules out group knowledge, restricting knowledge possession to individuals.<sup>5</sup>

The fundamental opposition between epistemic autonomy and epistemic extension is crucial in a certain class of cases. A growing number of philosophers, on the basis of diverse models of epistemic normativity, claim there are cases of knowledge in which no individual has the capacity to possess all the epistemic materials generating it.<sup>6</sup> That is, some

knowledge cannot be generated autonomously by any individual. Call these cases of *extra-individual knowledge* (EIK). The most vivid cases of EIK are scientific. Consider the CMS and ATLAS particle-detection experiments, which are two of seven experiments centralized at CERN's Large Hadron Collider. More than 3800 physicists, engineers, technicians, data analyzers, etc. of various sorts are actively involved in CMS, and more than 3000 in ATLAS. Some operate on-site but many operate remotely through the Worldwide LHC Grid. 42 countries and 182 institutes are actively involved in CMS, and 38 countries and 174 institutes in ATLAS. On July 4, 2012, the collaborations announced that their 2011 and 2012 results constitute strong evidence for the existence of the Higgs boson, the fundamental particle that gives mass to other fundamental particles. Arriving at the knowledge that Higgs particles exist involves the epistemic labour of, and inter-dependence between, many individuals with diverse expertise. This is a radically different picture of science than that suggested by the Royal Society of London's maxim, which to this day remains, "nullius in verba," meaning, "take nobody's word for it."<sup>7</sup>

If the epistemic materials generating EIK extend beyond any individual, who can possess such knowledge? This question was posed some time ago by John Hardwig (1985).<sup>8</sup> Though he framed the issue in different terms, Hardwig recognized that extensionists and proponents of an autonomy condition on knowledge will give different answers:

**Epistemic Autonomy:** to possess knowledge, a subject must possess all the epistemic materials generating it; so, EIK can be possessed only by the *group* subject across which epistemic materials extend.

**Epistemic Extension:** a subject can possess knowledge when other subjects possess some of the epistemic materials generating it; so, EIK can be possessed by *individual* subjects. That is, individuals can have *knowledge via epistemic extension*.

Proponents of epistemic autonomy have two options, one skeptical and one in tension with tradition. If only individuals can possess knowledge, then there is no such thing as EIK.

However, if groups can possess knowledge, then EIK can be ascribed to the group across which epistemic materials extend. Thus, proponents of an autonomy condition on knowledge must contend that any EIK must be group knowledge. Extensionists contend that individuals can possess EIK because individuals can possess knowledge without possessing all the epistemic material generating it. The dilemma posed by Hardwig is that one of two traditional tenets in epistemology must be abandoned to permit EIK: only individuals can possess knowledge, or knowledge bearers must be epistemically autonomous. Hardwig's intuition in favour of the latter was stronger: if the only plausible autonomous knowledge bearer is a group, the knowledge bearer is a group. Thus, Hardwig favoured option (1) of his dilemma, negatively characterizing the alternative as "vicarious knowledge" (1985, 344, 348).<sup>9</sup>

In the remainder of this section, I survey a handful of diverse models of epistemic normativity, each predicated upon or implying epistemic extension. Each offers a way of endorsing option (2) of Hardwig's dilemma. I begin with Sanford Goldberg, who points out that most externalists understand the cognitive operations of others involved in an individual subject *S* arriving at testimonial belief as features of *S*' belief-generating environment, relative to which *S*' testimonial belief is appraised, but not as part of the belief-generating process itself (2010, 36).<sup>10</sup> Most epistemologists of testimony, reductionists and non-reductionists alike, take the scope of appraisal of testimonial belief to range over the testimonial exchange itself. The scope of appraisal is not taken to extend over the formation of the testifier's belief or assertion that *p*, which consists of epistemic materials located perhaps a minute, a day, a week, a month, a year, or even further in the past. Yet, Goldberg argues that the formation of the testifier's belief is often a salient part of why the recipient of testimony arrives at the truth. If the normativity required for knowledge includes concern with the propensity to arrive at the truth, then the testimonial

exchange is only the terminal phase of the testimonial-belief-generating process.

Epistemological appraisal ought to extend over the formation of the testifier's belief (*ibid*, ch.4). That is, some knowledge is EIK, and it can be possessed by individuals. This is knowledge *via* epistemic extension.<sup>11</sup>

Many philosophers contend, or their models imply, that denying the possibility of EIK comes at a high skeptical price: many cases of what we want to call knowledge are not really knowledge.<sup>12</sup> Several of these philosophers agree with Goldberg's (2010; 2011; 2012) underlying idea that the epistemic materials involved in a testimonial exchange itself often fail to satisfy the normativity required for knowledge, and so the scope of epistemological appraisal must extend beyond the testimonial exchange.<sup>13</sup> This means testimonial knowledge is often generated by the epistemic materials involved in a testimonial exchange plus those (past) materials attributed to the testifier. Epistemic extension bridges the gap.

Boaz Miller (2015) draws our attention to the results of an anonymous survey published in *Nature* of 3200 scientists (Martinson *et. al.* 2005). 6% of scientists report "failing to present data that contradict one's own previous research." 12.5% report "overlooking others' use of flawed data or questionable interpretation of data." 13.5% report "using inadequate or inappropriate research designs." 15.5% report "dropping observations or data points from analyses based on a gut feeling that they were inaccurate." 15.5% admit to "changing the design, methodology or results of a study in response to pressure from a funding source." Presumably, these results are subject to the underreporting phenomenon that psychologists have shown is common when subjects are directed to offer negative self-reports, even anonymously (e.g. Brenner & DeLamater 2016). Miller has us contrast Jekyll and Hyde, who reside in very close possible worlds. Both come to correctly believe that *p via* identical reports of identical authoritative scientific studies. In both worlds, the identical authors of identical scientific studies discarded an identical subset of the collected data that,

if included, would have rendered the entire data set less starkly in-line with *p*. The only difference between the two worlds is as follows. In Jekyll's world, the authors had good reasons for rejecting the data. In Hyde's world, the same good reasons were available to the authors, but instead of putting in the work to acquire those good reasons, they instead rejected the data "based on a gut feeling" (Martinson *et. al.* 2005).<sup>14</sup>

The problem Miller identifies is that the recipient of testimony often cannot determine whether they are in a Hyde-like or Jekyll-like scenario. There is a difference in the epistemic materials generating Jekyll's and Hyde's beliefs, but that difference is opaque to Jekyll and Hyde. To account for the epistemic difference between Hyde-like and Jekyll-like scenarios, Miller proposes a principle analogous to epistemic extension, what he calls Knowledge-Level Justification Communalism:

...whether some of the true beliefs that *S* holds are sufficiently justified to amount to knowledge... depends on evidence (or other building blocks of which epistemic justification consists) which *S* does not possess or are not situated within *S*'s own cognitive system, but are possessed by, or situated within the cognitive systems of other relevant members of *S*'s epistemic community. (419)

This principle takes the burden off the individual knowledge bearer of inspecting all the epistemic materials generating it.

Much of this support for epistemic extension is negative: reasons to reject epistemic autonomy as a necessary condition for possessing knowledge.<sup>15</sup> Yet, some epistemologists offer positive ways of explicating knowledge *via* epistemic extension. These include some epistemologists of cognitive externalism, particularly of extended cognition.<sup>16</sup> According to extended cognition, cognition can extend 'outside the head', over artifacts, environmental features, and other subjects. When an individual comes to have knowledge *via* extending her cognition over the cognitive efforts of others, she does not possess all the epistemic materials involved. In such cases, epistemic extension obtains. I say this is a positive

explication of knowledge *via* epistemic extension because it is a specific, psychological characterization of what is fundamentally an epistemological phenomenon. Furthermore, a minimal condition is placed on an individual *S* who depends on others for epistemic materials: all epistemic materials must fall within the scope of *S*' extended cognition.<sup>17</sup>

Berit Brogaard (2014, 57-60) places a more stringent condition on *S*: *S* must *responsibly* extend her cognition over the cognitive efforts of others. Like Lackey (2007; 2009) and Vaesen (2011b), Brogaard rejects credit theories, according to which *S* knows that *p* only if *S* is creditable for truly believing that *p*, that is, only if all epistemic materials are creditworthy contributions of *S*. Brogaard contends that credit theories cannot account for cases in which cognition, and therefore credit, extends beyond *S*. She proposes that when *S* is not creditable with all epistemic materials, *S* can possess knowledge by satisfying a responsibilist condition on her relationship to epistemic materials contributed by others.<sup>18</sup>

Adam Green (2012; 2014), on the other hand, aims to rescue credit theory by extending it. Citing Goldberg's work, Green conceives of a credit theory that characterizes all epistemic materials as creditworthy contributions but also permits *S* to possess knowledge when depending on others' creditworthy contributions. Although Green and Brogaard disagree about credit theory, they agree that an individual can possess knowledge without possessing all the epistemic materials generating it. Thus, both are extensionists.<sup>19</sup>

To summarize this survey, some extensionists offer mostly negative motivation toward epistemic extension and away from epistemic autonomy.<sup>20</sup> Others offer positive, psychological explications of knowledge *via* epistemic extension.<sup>21</sup> Others still are more narrowly concerned with placing conditions on an individual beneficiary *S* of epistemic materials possessed by others.<sup>22</sup> There is much left to explore about the nature of knowledge *via* epistemic extension. This is a major frontier in social epistemology.<sup>23</sup>

## 2. A Framework for Social Epistemology

Hardwig's dilemma entails that at least one of two traditional, individualistic tenets in epistemology must be abandoned: the necessity of epistemic autonomy for knowledge, or the idea that knowledge is possessed by individuals, not groups. One can endorse the non-traditional claim that groups can possess knowledge while retaining the traditional claim that epistemic autonomy is necessary for knowledge (e.g. Vaesen 2011a; de Ridder 2014). Alternatively, one can retain the traditional claim that only individuals can possess knowledge and simultaneously endorse the non-traditional claim that knowledge can be generated *via* epistemic extension.<sup>24</sup>

Here is another, less-explored combination: one can endorse the non-traditional claim that groups can possess knowledge and also endorse the non-traditional claim that knowledge can be generated *via* epistemic extension. That is, extensionists can maintain that groups can possess knowledge. Indeed, they can maintain that groups can possess knowledge *via* epistemic extension, a phenomenon explored in section 3.

While the mere occurrence of EIK underdetermines group knowledge, there are many other reasons for thinking there groups can have knowledge. Some propose that groups can be ascribed with doxastic or sufficiently doxastic-like states (e.g. group beliefs, acceptances) which, like individual doxastic states, can satisfy the remaining conditions on knowledge. Others propose that a group can be the type of agent or even person that constitutes a proper epistemic subject.<sup>25</sup> Just one example is the plural-subject account of grouphood, according to which a group can have a doxastic state (i.e. belief or acceptance) that is irreducible to the doxastic states of its individual members.<sup>26</sup> A common example is a hiring committee which determines that Jane is the best candidate even though no individual member of the committee believes Jane is the best candidate. This occurs because the committee's decision procedure is to average each individual committee

member's ranked list of candidates. The winning candidate, Jane, has the highest average rank without being at the top of any individual member's list. Plural subject accounts typically include a normative bind between group members who jointly commit to not contravene the group's view. In such cases, a complete description of a group's doxastic state must include something in addition to the doxastic states of its individual members. A description of the hiring committee's doxastic state includes the fact that the committee's membership jointly commits to the group's decision.

So, one's reasons for thinking groups can have knowledge need not conflict with one's reasons for thinking knowledge *via* epistemic extension sometimes obtains. As mentioned, this combination in cases of EIK points to the possibility of group knowledge *via* epistemic extension, the idea that group subjects can be epistemically dependent on other subjects and entities.

The distinctions between individual knowledge and group knowledge, epistemic autonomy and epistemic extension, and internalism and externalism run orthogonally to one another for the most part, generating six distinct combinations of views (fig.1):

fig.1

	<b>Epistemological Internalism</b>	<b>Epistemological Externalism</b>	
		<b>Epistemic Autonomy</b>	<b>Epistemic Extension</b>
<b>Individual Knowledge/ Subjecthood</b>	Individual subject <i>S</i> possesses knowledge that <i>p</i> , and all epistemic materials are internal states or exercises of <i>S</i> .	Individual subject <i>S</i> possesses knowledge that <i>p</i> , and all epistemic materials are internal or external states or exercises of <i>S</i> .	Individual subject <i>S</i> possesses knowledge that <i>p</i> , and some epistemic materials are internal or external states or exercises of subjects beside <i>S</i> .
<b>Group Knowledge/ Subjecthood</b>	Group subject <i>G</i> possesses knowledge that <i>p</i> , and all epistemic materials are internal states or exercises of <i>G</i> .	Group subject <i>G</i> possesses knowledge that <i>p</i> , and all epistemic materials are internal or external states or exercises of <i>G</i> .	Group subject <i>G</i> possesses knowledge that <i>p</i> , and some epistemic materials are internal or external states or exercises of subjects beside <i>G</i> .

Mainstream epistemology has explored only two of six combinations of views (marked yellow). The increasingly popular claim that group knowledge sometimes obtains opens-up two new combinations of views (marked blue). Yet, if epistemic autonomy is assumed and

epistemic extension is overlooked, two additional combinations are neglected (marked green). The combination of individual knowledge and epistemic extension (top-green) is a recent and radical development, but it has become increasingly popular.

The combination that has yet to be fully delineated in the literature is group-level epistemic extension (bottom-green). A good deal of the literature cited in this paper, and the bulk of extant work in group epistemology, can be classified as *intra*-group epistemology: concern for epistemically salient happenings within groups (marked blue).<sup>27</sup> In the following section, I delineate and try to motivate the exploration of *inter*-group epistemology: concern for epistemically salient happenings between groups. This promises to be an important frontier in social epistemology.<sup>28</sup>

### **3. Hardwig's Dilemma at the Group Level, and Inter-Group Epistemology**

Recall that cases of *extra-individual knowledge* (EIK) are cases in which no individual has the capacity to possess all the epistemic materials generating it. That is, some knowledge cannot be generated autonomously by any individual. The question posed by Hardwig is, *who possesses EIK?* Is it the epistemically autonomous subject (i.e. the group across which epistemic materials extend) or an epistemically dependent subject (i.e. an individual *via* epistemic extension)? These two options constitute Hardwig's dilemma. To explore this dilemma and use it to generate a taxonomy of available positions concerning knowledge attribution, I did not need to distinguish between types of groups or mark the differences between extant accounts of grouphood or group knowledge. The taxonomy I presented in the previous section (fig.1) is intended to accommodate diverse and opposed views. In this section, I argue that if groups can have knowledge, some of it is knowledge *via* epistemic extension. This claim is necessary for inter-group epistemology to get off the

ground. Establishing it will require me to distinguish between some different types of groups, accounts of grouphood, and accounts of group knowledge.

There are different kinds of groups: teams, corporations, families, etc. Some of these are best described as plural subjects. Earlier, I considered the example of a hiring committee. Each member of the committee jointly commits to the committee's decision procedure for selecting a candidate and to the result that procedure generates. A jury is another paradigm example of a plural subject. Suppose a jury finds the defendant, Colonel Mustard, not guilty of committing murder. Among all the evidence deliberated upon by the jury is evidence received from several expert witnesses—a clinical psychiatrist, a blood spatter analyst, and a forensic firearms expert. None of the expert witnesses walks the jury, step-by-step, through all her technical work. This would require each juror to complete the training and education required to become an expert. Instead, each expert witness offers a layperson summary of her work to the Court. Suppose the totality of evidence satisfies the normative conditions for knowledge that Colonel Mustard is not guilty. No individual can possess all the epistemic materials generating this knowledge. Each expert witness contributes epistemic materials—the justificatory grounds for the claims delivered in her testimony—which are opaque to each member of the jury. Thus, knowledge that Colonel Mustard is not guilty is EIK.

Following Hardwig, we ask, *who can possess this knowledge?* For now, let's set aside option (2) of Hardwig's dilemma, according to which knowledge can be attributed to a subject that does not possess all the epistemic materials generating it (i.e. knowledge *via* epistemic extension). According to option (1), knowledge can be possessed only by a subject that possesses all the epistemic materials generating it. That is, knowledge can be possessed only by an epistemically autonomous subject. Thus, no member of the jury can possess this knowledge. But not even the jury together, considered as a plural subject, can possess this

knowledge because some of the epistemic materials generating it (e.g. expert contributions) are beyond the capacity of the jury to ‘double-check’ by any decision procedure juries typically employ. Indeed, this is the interesting feature of this case of EIK: proponents of an epistemic autonomy condition on knowledge cannot attribute knowledge to the jury. Instead, they must attribute it to the collection of individuals across which epistemic materials extend: the jury plus the expert witnesses. Perhaps epistemic materials are distributed even more diffusely than this. Presumably, the legal apparatus for admitting evidence and instructing the jury is epistemically salient. Yet, it is beyond the jury to monitor this apparatus to determine whether or not it is functioning properly. It is at least plausible, then, that the judge, prosecution, and defence are also constitutive of the group across which epistemic materials extend. Perhaps, also, the expert testimony presented by one or more expert witness was generated collaboratively. Suppose the forensic firearms expert relied upon the expertise of a firearms dealer who was intimately familiar with the type of antique firearm believed to be the murder weapon. If epistemic materials are distributed this diffusely, not even ‘the Court’ can be said to autonomously know that Colonel Mustard is not guilty, since the Court relies on epistemic materials coming from outside the Court. Indeed, such a dependence relation is implicit in the very concept of *expert testimony*. The only ‘group’ that can know autonomously is the diffuse collection of individuals—jury members, judge, attorneys, expert witnesses, and perhaps others—who were collected together in *ad hoc* fashion for this unique, non-repeated scenario.

What is special about cases of EIK like the one just explored is that insistence upon an autonomy condition on knowledge—option (1) of Hardwig’s dilemma—requires one to attribute knowledge to diffuse, transient, and/or *ad hoc* groups, since this is how diffusely epistemic materials are distributed in these cases. Call this subset of EIK *diffuse extra-individual knowledge* (EIK-D). In less messy cases of EIK, option (1) of Hardwig’s dilemma

attributes knowledge to groups with identities that are more substantive and persist, groups with identities grounded in something more than their mere involvement in generating a specific instance of knowledge. Hardwig's dilemma for cases of EIK-D has use choose between attributing knowledge to (1) an autonomous subject—in this case, an *ad hoc*, transient group—or to (2) a subject that depends on epistemic materials distributed across an *ad hoc*, transient group. Option (2) attributes knowledge *via* epistemic extension.

The interesting thing about option (2) in cases of EIK-D is that it need not attribute knowledge to individuals. It can result in group knowledge attribution. As I emphasized in the previous section, one can be an extensionist and also think groups can possess knowledge. In cases of EIK-D, if one wishes to attribute knowledge that Colonel Mustard is not guilty to the jury, one must attribute to them knowledge *via* epistemic extension. I argue that if any group possesses EIK-D, it is a group with an identity that is substantive and persistent, like a jury.<sup>29</sup>

Put more precisely, if any group possesses EIK-D, it is a group that can satisfy the doxastic-state condition on knowledge.<sup>30</sup> One need not employ the plural subject account, but let's continue with it for now. Only the joint commitment of the jury's membership constitutes the jury's view. Only members of the jury jointly commit to its decision procedure, to its outcome, and to not contravene the outcome once it is delivered. Indeed, jury members are prohibited from commenting on the trial. No witness, attorney, or judge partakes in the jury's decision procedure or is committed to not contravene the jury's decision. A witness, attorney, or judge can oppose the jury's decision. A witness might be free to comment on the trial afterward. An attorney can file an appeal. A judge can write a dissenting opinion. According to option (1) of Hardwig's dilemma, the group that knows Colonel Mustard is not guilty is the jury plus expert witnesses plus judge, etc., since this is the diffuse collection of those who contribute epistemic materials. According to option (2),

the group that knows Colonel Mustard is not guilty is the jury. Option (2) and the plural subject account pick out the same group, which is the group that can satisfy the doxastic-state condition on knowledge.

However, other groups do not so easily fit the plural subject mold. Perhaps the grouphood of a large corporation or governmental department is not grounded only, if at all, in the joint commitment of its membership. Indeed, one might think highly structured groups like corporations are more like supra-individuals than plural subjects. After all, we treat these entities differently than we do paradigm plural subjects. For example, we hold a corporation as such legally responsible. In a legal proceeding involving a hiring committee, on the other hand, we treat legally with the individual members of the committee or with the corporation or university (i.e. the supra-individual) to which the committee belongs. In the jury example of EIK-D, the substantive identity of the jury, which that allows it to generate a doxastic state, is its plural subjecthood. But the important point is that, in cases of EIK-D, option (2) of Hardwig's dilemma picks out a group with a substantive identity *of some sort*, whether it is plural subjecthood, supra-individuality, etc.<sup>31</sup> Many contend that plural subjects can satisfy the doxastic-state condition on knowledge. According to the accounts on offer, plural subjects generate beliefs or acceptances to which their membership jointly commits, and these could satisfy the other conditions on knowledge. It is quite plausible that supra-individuals can also satisfy the doxastic-state condition on knowledge. Such entities have elaborate structures and procedures for arriving at collective positions. Corporations arrive at decisions to rebrand, rename, direct extra resources to marketing a specific product, seek a partnership, etc. They also submit pleas *qua* corporate entity in legal proceedings. They can claim to be guilty, not guilty, owed damages, etc. Supra-individuals can generate and hold any such position in a more or less epistemically successful manner. A decision to rebrand or a legal claim to damages can be either justified or unjustified.

However, some argue against a doxastic-state condition on group knowledge. Alexander Bird (2014) argues that knowledge can be possessed by “organic groups,” which are loosely structured collections. While organic groups do not possess doxastic states, they can nevertheless be attributed with epistemic states (2014, 55) and are thereby the kinds of groups to which we can attribute knowledge. Søren Klausen (2015) contends that if we insist on a doxastic-state condition on knowledge, then we must interpret most group knowledge attributions metaphorically. Consider a few (815):

- (a) “By then, the Russians knew how to build the bomb”
- (b) “The CIA did not know the identity of the drone attack victims”
- (c) “The CIA did not know of the attack in advance”
- (d) “The government did not know what they [sic] wanted from the website”
- (e) “They knew immediately that their lunar landing would have to be aborted”
- (f) “Ensure that the crew knows how to handle the boat should the captain not be on board”
- (g) “What cell biologists already knew is that the EGF receptor–ubiquitin complex binds to a protein called Hrs”
- (h) “He saw his theory as following logically from what biologists already knew about natural selection”

In all these cases, the group seemingly attributed with knowledge is a group to which we cannot plausibly attribute doxastic states.<sup>32</sup>

Both Bird and Klausen recognize that many group knowledge attributions are actually EIK-D: they are cases in which the epistemic materials involved are diffusely distributed, beyond any subject to which we can attribute doxastic states using extant accounts in social ontology. Earlier in the paper, I showed that the mere occurrence of EIK underdetermines group knowledge attribution. A group knowledge attribution might be appropriate, but the mere occurrence of EIK does not itself require it. This is because it remains a live option, until shown otherwise, that an individual knows *via* epistemic

extension. Though he did not himself endorse it, Hardwig recognized this as a live option several decades ago, which is why he did not assume EIK ought to be attributed to groups across which epistemic materials extend. Bird and Klausen now prompt me to generalize this point: the mere occurrence of EIK, including EIK-D, underdetermines the claim that knowledge is possessed by the precise collection across which epistemic materials extend. This is because it remains a live option, until shown otherwise, that *some subject* knows *via* epistemic extension, be it an individual or group subject.<sup>33</sup>

Thus, for cases of EIK-D, we are not confined to the dilemma Klausen poses: interpret claims like (a)-(h) as legitimate knowledge attributions or interpret them metaphorically. The possibility of knowledge *via* epistemic extension presents a third option: interpret claims like (a)-(h) as identifications of the relevant domain of epistemic materials, of what we might call the epistemic process or environment generating the knowledge cited. Bird and Klausen are right that epistemic materials are often diffusely distributed. But this does not require a symmetrical view of knowledge attribution. Put in Bird's terms, the claim that the relevant epistemic states generating knowledge are diffusely distributed does not entail the claim that knowledge ought to be attributed to that same, diffuse collection. If epistemic extension is possible in cases of EIK-D, then a substantive group subject can possess knowledge while relying on these diffusely distributed epistemic materials. The possibility of knowledge *via* epistemic extension means attributions of EIK-D, like (a)-(h), do not require us to drop the doxastic-state condition on knowledge. I maintain that if there is group knowledge, some of it, specifically EIK-D, is knowledge *via* epistemic extension.<sup>34</sup>

I close this section by addressing extensionists. If the extensionist is already willing to agree that groups can possess knowledge, she should not need much motivation to accept the claim that groups can know *via* epistemic extension. This is because the reasons for

thinking epistemic extension obtains at the individual level are just as compelling, if not more compelling, when reformulated into reasons for thinking epistemic extension obtains at the group level. Goldberg (2010) shows that individual recipients of testimony can be dependent on others' epistemic materials. He argues that whether a recipient of testimony arrives at the truth often depends on the justification-basis of the testifier's belief or assertion. The same reasoning applies at the group level. In order to determine whether a group  $G$ 's testimonial belief (or acceptance) amounts to knowledge, appraisal ought to extend over epistemic materials that cannot be ascribed to  $G$ . If groups (e.g. juries) can receive testimony (e.g. from expert witnesses), Goldberg's argument is easily reformulated into an equally-compelling argument for extended group knowledge.<sup>35</sup>

If groups can receive testimony, Miller's (2015) argument for epistemic extension is *stronger* when reformulated into an argument that epistemic extension obtains at the group level. This is the case if the normative conditions on group knowledge are more difficult to satisfy than the normative conditions on individual knowledge. This claim is defended by several philosophers.<sup>36</sup> For example, just one of Jennifer Lackey's conditions for a group  $G$  justifiably believing that  $p$  is that "[a] significant percentage of the operative members of  $G$ ... justifiably believe that  $p$ " (381). Recall Miller's (2015) argument and data showing that sometimes when we want to say individual  $S$  knows that  $p$ , things could too easily have gone wrong in ways opaque to  $S$  (§V). That is, Hyde-like scenarios are relatively common, even in science. Epistemic extension allows us to draw the important epistemic differences between Hyde-like and Jekyll-like scenarios. In Hyde-like scenarios, there is epistemic misconduct. In Jekyll-like scenarios, there is not. But one cannot determine whether they are in a Hyde-like or Jekyll-like scenario. If a necessary condition for group  $G$  justifiably believing that  $p$  is that a "significant percentage of the operative members of  $G$ " must each justifiably believe that  $p$ , then things could go wrong in many more ways that are opaque to  $G$  than it can

wrong in ways opaque to any one of its operative members *S*. For any given operative member *S*' belief that *p*, there is the possibility of a Hyde-like scenario. For the group *G*'s belief that *p*, that possibility is perhaps as many times more likely as whatever number equals a "significant percentage of operative members of *G*." If we resist epistemic extension, group knowledge is possible only if a significant percentage of *G*'s operative members can rule out the possibility that they are in a Hyde-like scenario. So, if we need epistemic extension to prevent the possibility of Hyde-like scenarios from undercutting the epistemic success of Jekyll-like *individual* beliefs, then we surely need epistemic extension to prevent the occurrence of Hyde-like scenarios from undercutting the epistemic success of Jekyll-like *group* doxastic states (i.e. group beliefs, acceptances, positions, etc.).

## **Conclusion**

In this paper, I connected the ideas of group knowledge and epistemic extension, both departures from traditional epistemology but both increasingly popular. This allowed me to generate a taxonomy of contemporary epistemology along three core axes: the distinctions between epistemological internalism and externalism, individual and group knowledge, and epistemic autonomy and extension. I then delineated and attempted to motivate the exploration of what I dubbed inter-group epistemology, which is the domain of group epistemology that studies the ways groups are epistemically dependent on other subjects and entities.

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## References

- Aad, Georges, Tatevik Abajyan, Brad K. Abbott, Jalal Mohamad Abdallah, S. Abdel Khalek, Ahmed Ali Abdelalim, Ovsat B. Abdinov, *et al.* (2012). "Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC." *Physics Letters B* 716(1): 1-29.
- Aad, Georges, Brad K. Abbot, Jalal Mohamad Abdallah, Ovsat B. Abdinov, Rosemarie Aben, Maris Abolins, Ossama AbouZeid, *et. al.* (2015). "Combined Measurement of the Higgs Boson Mass in *pp* Collisions at  $\sqrt{s}=7$  and 8 TeV with the ATLAS and CMS Experiments." *Physical Review Letters* 114(19): 1-45.
- Alston, William (1995). "How to Think about Reliability." *Philosophical Topics* 23(1): 1-29.
- Andersen, Hanne (2010). "Joint Acceptance and Scientific Change." *Episteme* 7(3): 248-65.
- Andersen, Hanne and Susan Wagenknecht (2013). "Epistemic Dependence in Interdisciplinary Groups." *Synthese* 190(11): 1881-98.
- Baumann, Caroline (2011). "Gilbert's Account of Norm-Guided Behaviour: A Critique." In Hans Bernhard Schmid, Daniel Dierkes, and Marcel Weber (eds.). *Collective Epistemology*. Frankfurt, Germany: Ontos Verlag. 227-41.

- Beatty, John and Alfred Moore (2010). "Should We Aim for Consensus?" *Episteme* 7(3): 198-214.
- Bird, Alexander (2010). "Social Knowing: The Social Sense of 'Scientific Knowledge'." *Philosophical Perspectives* 24(1): 23-56.
- \_\_\_\_\_. (2014). "When is there a Group that Knows?" In J. Lackey (ed.). *Essays in Collective Epistemology*. Oxford: Oxford University Press. 42-61.
- Bouvier, Alban (2004). "Individual Beliefs and Collective Beliefs in Science and Philosophy: The Plural Subject and the Polyphonic Subject Accounts." *Philosophy of the Social Sciences* 34(3): 382-407.
- \_\_\_\_\_. (2010). "Passive Consensus and Active Commitment in the Sciences." *Episteme* 7(3): 185-97.
- Brenner, Philip S., and John DeLamater (2016). "Lies, Damned Lies, and Survey Self-Reports? Identity as a Cause of Measurement Bias." *Social Psychology Quarterly* 79(4): 333-354.
- Briggs, Rachael (2012). "The Normative Standing of Group Agents." *Episteme* 9(3): 283-91.
- Briggs, Rachael, Fabrizio Cariani, Kenny Easwaran, and Branden Fitelson (2014). "Individual Coherence and Group Coherence." In J. Lackey (ed.). *Essays in Collective Epistemology*. Oxford: Oxford University Press. 215-38.
- Brogaard, Berit (2014). "A Partial Defense of Knowledge via epistemic extension." *Philosophical Issues* 24(1): 39-62.
- Cariani, Fabrizio (2012). "Epistemology in *Group Agency*: Six Objections in Search of the Truth." *Episteme* 9(3): 255-69.
- Carter, J. Adam (2015). "Group Knowledge and Epistemic Defeat." *Ergo* 2(28): 711-35.
- Carter, J. Adam, Jesper Kallestrup, Orestis Palermos, and Duncan Pritchard (2014). "Varieties of Externalism." *Philosophical Issues* 24(1): 63-109.

- Chatrchyan, Serguei, Vardan Khachatryan, Albert M. Sirunyan, Armen Tumasyan, Wolfgang Adam, Ernest Aguilo, Thomas Bergauer, *et. al.* (2012). "Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC." *Physics Letters B* 716(1): 30-61.
- Cheon, Hyundeuk (2014). "In What Sense Is Scientific Knowledge Collective Knowledge?" *Philosophy of the Social Sciences* 44(4): 407-23.
- Clarke, Andy (2015). "What 'Extended Me' Knows." *Synthese* 192(11): pp.3757-75.
- Clark, Andy and David Chalmers (1998). "The Extended Mind." *Analysis* 58(1): 7-19.
- de Ridder, Jeroen (2014). "Epistemic Dependence and Collective Scientific Knowledge." *Synthese* 191(1): 37-53.
- Dewitt, Aaron (2012). "Group Agency and Epistemic Dependency." *Episteme* 9(3): 235-44.
- Dragos, Chris (2016a). "Which Groups Have Scientific Knowledge?: Wray vs. Rolin." *Social Epistemology* 30(5-6): 611-23.
- \_\_\_\_\_ (2016b). "Justified Group Belief in Science." *Social Epistemology Review and Reply Collective* 5(9): 6-12.
- \_\_\_\_\_ (2019). "Groups Can Know How." *American Philosophical Quarterly*. 56(3): 265-76.
- Fagan, Melinda (2011). "Is there Collective Scientific Knowledge? Arguments from Explanation." *Philosophical Quarterly* 61(243): 247-69.
- \_\_\_\_\_ (2012). "Collective Scientific Knowledge." *Philosophy Compass* 7(12): 821-31.
- Fallis, Don (2007). "Collective Epistemic Goals." *Social Epistemology* 21(3): 267-80.
- Frans, Joakim and Laszlo Kosolosky (2014). "Mathematical Proofs in Practice: Revisiting the Reliability of Published Mathematical Proofs." *Theoria* 29(3): 345-60.
- Geist, Christian, Benedikt Löwe, and Bart Van Kerkhove (2010). "Peer Review and Knowledge by Testimony in Mathematics." In B. Löwe and T. Müller (eds.).

*Philosophy of Mathematics: Sociological Aspects and Mathematical Practice.*

London: College Publications. 155-78.

Giere, Ronald (2002). "Discussion Note: Distributed Cognition in Epistemic Cultures."

*Philosophy of Science* 69(4): 637-44.

\_\_\_\_\_ (2006). *Scientific Perspectivism*. Chicago: University of Chicago Press.

\_\_\_\_\_ (2007). "Distributed Cognition without Distributed Knowing." *Social Epistemology* 21(3): 313-20.

\_\_\_\_\_ (2011). "Distributed Cognition as Human Centered although not Human Bound: Reply to Vaesen." *Social Epistemology* 25(4): 393-99.

\_\_\_\_\_ (2012). "Scientific Cognition: Human Centered but not Human Bound." *Philosophical Explorations* 15(2): 199-206.

Gilbert, Margaret (1989). *On Social Facts*. London: Routledge.

\_\_\_\_\_ (1994). "Remarks on Collective Belief." In F. F. Schmitt (ed.). *Socializing Epistemology: The Social Dimensions of Knowledge*. Lanham, MD: Rowman and Littlefield. 235-56.

\_\_\_\_\_ (2000). "Collective Belief and Scientific Change." In *Sociality and Responsibility: New Essays in Plural Subject Theory*. Lanham, MD: Rowman and Littlefield. 37-49.

\_\_\_\_\_ (2004). "Collective Epistemology." *Episteme* 1(2): 95-107.

Gilbert, Margaret and Daniel Pilchman (2014). "Belief, Acceptance, and What Happens in Groups: Some Methodological Considerations." In J. Lackey (ed.). *Essays in Collective Epistemology*. Oxford: Oxford University Press. 189-212.

Goldberg, Sanford (2010). *Relying on Others: An Essay in Epistemology*. Oxford: Oxford University Press.

\_\_\_\_\_ (2011). "Division of Epistemic Labor." *Episteme* 8(1): 112-25.

- \_\_\_\_\_ (2012). "Epistemic Extension, Testimony, and the Epistemology of Instrument-Based Belief." *Philosophical Explorations* 15(2): 181-97.
- Goldman, Alvin (1979). "What is Justified Belief?" In George S. Pappas (ed.). *Justification and Knowledge*. Dordrecht, Netherlands: Dordrecht Reidel. 1-23.
- \_\_\_\_\_ (2004). "Group Knowledge versus Group Rationality: Two Approaches to Social Epistemology." *Episteme* 1(1): 11-22.
- \_\_\_\_\_ (2014). "Social Process Reliabilism." In J. Lackey (ed.). *Essays in Collective Epistemology*. Oxford: Oxford University Press. 11-39.
- Grear, Joseph F. (2010). "Errors and Corrections in Mathematics Literature." *Notices of the American Mathematical Society* 60(4): 418-25.
- Green, Adam (2012). "Extending the Credit Theory of Knowledge." *Philosophical Explorations* 15(2): 121-32.
- \_\_\_\_\_ (2013). "Deficient Testimony is Deficient Teamwork." *Episteme* 11(2): 213-27.
- \_\_\_\_\_ (2014). "Evaluating Distributed Cognition." *Synthese* 191(1): 79-95.
- Hakli, Raul (2007). "On the Possibility of Group Knowledge without Belief." *Social Epistemology* 21(3): 249-66.
- \_\_\_\_\_ (2011). "On Dialectical Justification of Group Beliefs." In Hans Bernhard Schmid, Daniel Dirtes, and Marcel Weber (eds.). *Collective Epistemology*. Frankfurt, Germany: Ontos Verlag. 119-53.
- Hardwig, John (1985). "Epistemic Dependence." *The Journal of Philosophy* 82(7): 335-49.
- Hutchins, Edwin L. (1995). *Cognition in the Wild*. Cambridge, MA: MIT Press.
- Kelp, Christoph (2013). "Extended cognition and Robust Virtue Epistemology." *Erkenntnis* 78(2): 245-52.
- \_\_\_\_\_ (2014). "Extended Cognition and Robust Virtue Epistemology: Response to Vaesen." *Erkenntnis* 79(3): 729-32.

- Klausen, Søren H. "Group Knowledge: A Real World Approach." *Synthese* 192(3): 813-39.
- Knorr-Cetina, Karin (1999). *Epistemic Cultures: How the Sciences Make Knowledge*.  
Cambridge, MA: Harvard University Press.
- Kusch, Martin (2002). *Knowledge by Agreement*. Oxford: Oxford University Press.
- \_\_\_\_\_ (2014). "The Metaphysics and Politics of Corporate Personhood." *Erkenntnis* 79(9):  
1587-600.
- Lackey, Jennifer (2007). "Why We Don't Deserve Credit for Everything We Know."  
*Synthese* 158(3): 345-61.
- \_\_\_\_\_ (2009). "Knowledge and Credit." *Philosophical Studies* 142(1): 27-42.
- \_\_\_\_\_ (2014). "Socially Knowledge Knowledge." *Philosophical Issues* 24(1): 282-98.
- \_\_\_\_\_ (2016). "What is Justified Group Belief?" *Philosophical Review* 125(3): 341-96.
- List, Christian (2005). "Group Knowledge and Group Rationality: A Judgement Aggregation  
Perspective." *Episteme* 2(1): 25-38.
- \_\_\_\_\_ (2016). "What is it Like to be a Group Agent?" *Nous*, doi: 10.1111/nous.12162: 1-25.
- List, Christian and Philip Pettit (2006). "Group Agency and Supervenience." *Southern  
Journal of Philosophy* 44(S1): 85-105.
- \_\_\_\_\_ (2011). *Group Agency: The Possibility, Design, and Status of Corporate Agents*.  
Oxford: Oxford University Press.
- \_\_\_\_\_ (2012). "Episteme Symposium on Group Agency: Replies to Gaus, Cariani, Sylvan,  
and Briggs." *Episteme* 9(3): 293-309.
- Martinson, Brian C., Melissa S. Anderson, and Raymond de Vries (2005). "Scientists  
Behaving Badly." *Nature* 435(7043): 737-8.
- Mathiesen, Kay (2006). "The Epistemic Features of Group Belief." *Episteme* 2(3): 161-75.

- \_\_\_\_\_ (2011). "Can Groups Be Epistemic Agents?" In Hans Bernhard Schmid, Daniel Dierkes, and Marcel Weber (eds.). *Collective Epistemology*. Frankfurt, Germany: Ontos Verlag. 23-44.
- Miller, Boaz (2015). "Why (Some) Knowledge is the Property of a Community and Possibly None of its Members." *The Philosophical Quarterly* 65(260): 417-41.
- Nathanson, Melvyn B. (2008). "Desperately Seeking Mathematical Truth." *Notices of the American Mathematical Society* 55(7): 773.
- Palermos, Orestis (2014). "Knowledge and Cognitive Integration." *Synthese* 191(8): 1931-51.
- \_\_\_\_\_ (2015). "Active Externalism, Virtue Reliabilism and Scientific Knowledge." *Synthese* 192(9): 2955-86.
- \_\_\_\_\_ (2016). "Spreading the Credit: Virtue Reliabilism and Weak Epistemic Individualism." *Erkenntnis* 81(2): 305-34.
- \_\_\_\_\_ (2017). "Social Machines: A Philosophical Engineering." *Phenomenology and the Cognitive Sciences* 16(5): 953-78.
- Palermos, Orestis and Duncan Pritchard (2013). "Knowledge via epistemic extension and Social Epistemology." *Social Epistemology Review and Reply Collective* 2(8): 105-20.
- \_\_\_\_\_ (2016). "The Distribution of Epistemic Agency." In P. Reider (ed.). *Social Epistemology and Epistemic Agency: De-Centralizing Epistemic Agency*. New York, NY: Rowman & Littlefield. 109-26.
- Pettit, Philip (2014). "How to Tell if a Group is an Agent." In J. Lackey (ed.). *Essays in Collective Epistemology*. Oxford: Oxford University Press. 97-121.
- Pritchard, Duncan (2010). "Cognitive Ability and the Extended Cognition Thesis." *Synthese* 175(1): 133-51.

- \_\_\_\_\_ (2018a). "Extended Knowledge." In Carter, J. Adam, Andy Clark, Jesper Kallestrup, S. Orestis Palermos, and Duncan Pritchard (2018). *Extended Epistemology*. Oxford: Oxford University Press.
- \_\_\_\_\_ (2018b). "Extended Virtue Epistemology." *Inquiry* 61(5-6): 632-47.
- Rolin, Kristina (2008). "Science as Collective Knowledge." *Cognitive Systems Research* 9(1-2): 115-24.
- \_\_\_\_\_ (2010). "Extended Justification in Science." *Episteme* 7(3): 215-31.
- Schmitt, Frederick F. (1994). "The Justification of Group Beliefs." In F. F. Schmitt (ed.). *Socializing Epistemology: The Social Dimensions of Knowledge*. Lanham, MD: Rowman and Littlefield. 257-87.
- Shieber, Joseph (2013). "Toward a Truly Social Epistemology: Babbage, the Division of Mental Labor, and the Possibility of Socially Distributed Warrant." *Philosophy and Phenomenological Research* 86(2): 266-94.
- Smith, Leonie (2018). "The Curious Case of Ronald McDonald's Claim to Rights: An Ontological Account of Differences in Group and Individual Person Rights." *Journal of Social Ontology* 4(1): 1-28.
- Staley, Kent W. (2007). "Evidential Collaborations: Epistemic and Pragmatic Considerations in 'Group Belief.'" *Social Epistemology* 21(3): 321-35.
- \_\_\_\_\_ (2010). "Evidence and Justification in Groups with Conflicting Background Beliefs." *Episteme* 7(3): 232-47.
- Thagard, Paul (1997). "Collaborative Knowledge." *Noûs* 31(2): 242-61.
- \_\_\_\_\_ (2010). "Explaining Economic Crises: Are there Collective Representations?" *Episteme* 7(3): 66-83.
- Tollefsen, Deborah (2002). "Challenging Epistemic Individualism." *Protosociology* 16: 86-120.

- \_\_\_\_\_ (2015). "Groups as Agents." Cambridge: John Wiley & Sons.
- Tossut, Silvia (2014). "Membership and Knowledge: Scientific Knowledge as a Group Activity." *Episteme* 11(3): 349-67.
- Tuomela, Raimo (1992). "Group Beliefs." *Synthese* 91(3): 285-318.
- \_\_\_\_\_ (2004). "Group Knowledge Analyzed." *Episteme* 1(2): 109-27.
- \_\_\_\_\_ (2011). "An Account of Group Knowledge." In Hans Bernhard Schmid, Daniel Dierkes, and Marcel Weber (eds.). *Collective Epistemology*. Frankfurt, Germany: Ontos Verlag. 75-117.
- Vaesen, Krist (2011a). "Giere's (In)Appropriation of Distributed Cognition." *Social Epistemology* 25(4): 379-91.
- \_\_\_\_\_ (2011b). "Knowledge without Credit, Exhibit 4: Extended Cognition." *Synthese* 181(3): 515-29.
- \_\_\_\_\_ (2013). "Critical Discussion: Virtue Epistemology and Extended Cognition: A Reply to Kelp and Greco." *Erkenntnis* 78(4): 963-70.
- Wagenknecht, Susann (2016). *A Social Epistemology of Research Groups: Collaboration in Scientific Practice*. London: Palgrave Macmillan.
- Weatherall, James O. and Margaret Gilbert (2016). "Collective Belief, Kuhn, and the String Theory Community." In M. Brady and M. Fricker (eds.) (2016). *The Epistemic Life of Groups*. Oxford: Oxford University Press. 191-217.
- Wray, Brad (2001). "Collective Belief and Acceptance." *Synthese* 129(3): 319-33.
- \_\_\_\_\_ (2003). "What Really Divides Gilbert and Rejectionists?" *Protosociology* 18-19: 363-76.
- \_\_\_\_\_ (2007). "Who has Scientific Knowledge?" *Social Epistemology* 21(3): 337-47.
- \_\_\_\_\_ (2014). "Collaborative Research, Deliberation, and Innovation." *Episteme* 11(3): 291-303.

\_\_\_\_\_ (2018). “How Far can Knowledge via epistemic extension be Extended?: The Extension between Research Teams and Artifacts.” *Socially Extended Epistemology*. Oxford: Oxford University Press. 11-23.

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## Notes

<sup>1</sup> There are many different conceptions of grouphood. Unless otherwise stated, what I say about groups in this paper can apply, *mutatis mutandis*, to any type of group that is more than just the mereological sum of its individual members (and perhaps salient artefacts, depending on one’s epistemological and ontological views about the interface between agents and technology). Those who claim groups can have knowledge include Schmitt (1994); Hutchins (1995); Knorr-Cetina (1999); Gilbert (2000; 2004); Kusch (2002); Tollefsen (2002; 2015); Goldman (2004); Bouvier (2004; 2010); Tuomela (2004; 2011); List (2005); Mathiesen (2006; 2011); Fallis (2007); Wray (2007); Rolin (2008; 2010); Hakli (2011); Vaesen (2011a); Dewitt (2012); Palermos and Pritchard (2013; 2017); Bird (2010; 2014); de Ridder (2014); Lackey (2014); Carter (2015); Klausen (2015); Palermos (2015; 2017); Wagenknecht (2016).

<sup>2</sup> Proponents of epistemic extension (i.e. extensionists) include Thagard (1997; 2010); Giere (2002; 2006; 2007; 2011; 2012); Goldberg (2010; 2011; 2012); Fagan (2011; 2012); Green (2012; 2013; 2014); Shieber (2013); Palermos (2014; 2016); Kelp (2013; 2014); Brogaard (2014); Miller (2015); Pritchard (2010; 2018a; 2018b). de Ridder (2014) and Klausen (2015) are extensionists in a sense I qualify later. “Epistemic extension” is derived from Goldberg’s (2010) “epistemic extendedness.” It can apply to epistemic states other than knowledge but I talk mostly of knowledge in this paper. But for de Ridder (2014) and Klausen (2015), all extensionists cited above are concerned with knowledge ascribed to individuals, not groups. Some directly endorse the idea, epistemic extension, while others propose views entailing epistemic extension, such as certain epistemological views about extended cognition. I return to the relationship between epistemic extension and extended cognition later. I also clarify the distinction between epistemic externalism and epistemological externalism later. In this paper, I focus mostly on reliance upon epistemic materials possessed by other people. But what I say can apply, *mutatis mutandis*, to reliance on epistemic materials attributable to artefacts, institutions, social practices, or relations or connections between group members (i.e. systems). The important issue is whether or not those materials extend beyond any individual for a given case of knowledge.

<sup>3</sup> William Alston (1995), for example, understands “proximate” causes of a belief—that is, those located within the individual subject’s cognitive apparatus—to be the only epistemically salient ones (11-12, 15-16).

<sup>4</sup> There are several subtle distinctions between epistemic extension and other epistemological views that are worth drawing here. I address several in this note in anticipation of the objection that there are (far) more extensionists than I think. Some epistemologists maintain that epistemological appraisal is relative

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to belief-generating environments. For example, Janet's perceptual belief that the piano is red is reliably formed relative to normal lighting conditions which, if altered, could make the piano appear a different colour or appear red when it really is not. An aspect of the social turn in epistemology extends this to stress the relevance of belief-generating *social* environments. Such views do not entail epistemic extension, however, since they need not (and typically do not) take features of the context of appraisal to constitute epistemic materials. Instead, such accounts call for contextual appraisal (e.g. the attributer's context) of the epistemic materials involved. For example, the epistemic materials involved in generating Janet's perceptual belief do not include the lighting conditions. But one can nevertheless contend that appraisal of the epistemic materials involved must be relative to those lighting conditions. So, contextual appraisal does not entail epistemic extension. Secondly, normative properties are not epistemic materials. Rather, epistemic materials are subject to normative appraisal. So, for example, epistemic materials can stand in reliability relations, but reliability properties are not epistemic materials. Lastly, epistemic materials do not include reasons themselves but our response to or engagement with reasons, that is, what we take to be reasons. Thus, not even anti-reductionism about reasons entails epistemic extension. I thank two anonymous reviewers at *Synthese* for prompting me to clarify these issues more carefully.

<sup>5</sup> I am not claiming that Goldman (1979) had epistemic extension or group knowledge in mind at the time. I am only making use of this passage as expressing a common combination of views. Goldberg (2010, 121-2) employs the same passage for a similar purpose. More recently, Goldman (e.g. 2004; 2014) has endorsed the claim that there is group knowledge.

<sup>6</sup> e.g. Hardwig (1985); Schmitt (1994); Hutchins (1995); Thagard (1997; 2010); Knorr-Cetina (1999); Gilbert (2000; 2004); Kusch (2002); Giere (2002; 2006; 2007; 2011; 2012); Goldman (2004); Bouvier (2004; 2010); Tuomela (2004; 2011); List (2005); Mathiesen (2006; 2011); Fallis (2007); Wray (2007); Rolin (2008; 2010); Hakli (2011); Tollefsen (2002; 2015); Goldberg (2010; 2011; 2012); Vaesen (2011a); Fagan (2011; 2012); Dewitt (2012); Green (2012; 2013; 2014); Shieber (2013); Kelp (2013; 2014); Palermos (2014; 2016); Palermos and Pritchard (2013; 2016); Bird (2010; 2014); Brogaard (2014); de Ridder (2014); Lackey (2014); Carter (2015); Klausen (2015); Miller (2015) Palermos (2015; 2017); Wagenknecht (2016).

<sup>7</sup> For the original CMS and ATLAS results, see Chatrchyan *et. al.* (2012) and Aad *et. al.* (2012), respectively. The officially specified authors of these articles are "The CMS Collaboration" and "The ATLAS Collaboration," respectively, though lists of the 2900 and 2932 individual authors, respectively, are appended. For important results since 2012, see Aad *et. al.* (2015), which is a co-authored report of coordinated CMS and ATLAS measurements. The officially specified authors of this article are "The ATLAS and CMS Collaborations," though a list of the 5154 individual authors is appended.

<sup>8</sup> See Miller (2015) for why early work in the epistemology of testimony, which was in part prompted by Hardwig (1985), does not address the fundamental issue raised by Hardwig.

<sup>9</sup> Hardwig claimed only that his intuition in favour of an autonomy condition on knowledge was stronger than his intuition in favour of the claim that only individuals can have knowledge (348-9). His more

immediate concern was with posing a dilemma about how to analyze EIK. At least two philosophers have more recently forwarded an argument directly from the occurrence of EIK to the claim that groups must possess this knowledge, without addressing the possibility of knowledge *via* epistemic extension (Vaesen 2011a; de Ridder 2014). This move goes through only if epistemic autonomy is necessary for possessing knowledge. If epistemic extension is a viable principle, it undercuts this move.

<sup>10</sup> Goldberg focuses on process reliabilists, who typically understand the cognitive operations of others as relevant for determining the local reliability of the process generating *S*' testimonial belief but not for determining the global reliability of the process.

<sup>11</sup> Goldberg finds an analogue in memorial beliefs. *S* has a memorial belief that *p* when *p* is inferred from (or otherwise saliently dependent upon) *S*' memory of her previously acquired belief that *q* (65-7, 85-6). If *S*' belief that *q* was faulty upon acquisition, so is *S*' present belief that *p*: garbage-in, garbage-out. Most epistemologists agree that the epistemic materials generating memorial beliefs extend across time. Goldberg argues that, for some testimonial beliefs, they (also) extend across agents. If so, *S* can have knowledge without having all epistemic materials. In all the epistemically relevant ways, a memorial belief can be just like an extended testimonial belief. Often when *S* derives a memorial belief that *p* from *S*' previously acquired belief that *q*, the original epistemic materials that generated *S*' belief that *q* are opaque to *S*. Likewise, for an extended testimonial belief that *p*, the epistemic materials that generated the testifier's belief or assertion that *p* are opaque to the recipient. There is only one difference between these two kinds of cases: in the former, everything of epistemic importance happens in an individual subject's head, and in the latter it does not. To accept the uncontroversial model for memorial beliefs and, without additional argument, reject epistemic extension in some cases of testimonial belief, is to insist upon epistemic autonomy for its own sake.

<sup>12</sup> e.g. Hardwig (1985); Schmitt (1994); Thagard (1997; 2010); Knorr-Cetina (1999); Giere (2002; 2006; 2007; 2011; 2012); Tuomela (2004; 2011); Staley (2007; 2010); Goldberg (2010; 2011; 2012); Fagan (2011; 2012); Green (2012; 2013; 2014); Palermos (2014); Palermos and Pritchard (2013); Shieber (2013); Kelp (2013; 2014); Briggs *et. al.* (2014); Brogaard (2014); Cheon (2014); Goldman (2014); Tossut (2014); Miller (2015).

<sup>13</sup> e.g. Hardwig (1985); Green (2013); Shieber (2013); de Ridder (2014, 47-8); see especially Miller (2015, 421-2). I take it that epistemic extension is consistent with each of the reductionist, non-reductionist, generation, and transmission views of testimonial justification. See Miller (2015) on this point. Joseph Shieber (2013), like Goldberg, is a process reliabilist extensionist. He calls for a general, extended reliabilist account of knowledge, according to which,

- (1) Individuals are the primary bearers of knowledge.
- (2) Some individual *S* knows that *p* iff
  - a. *p*
  - b. *S* believes that *p*, and
  - c. *S*'s belief that *p* was produced by a process that reliably produces true beliefs, where

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- (3) Such processes may include the properties and actions of agents other than *S* as well as properties of the environment (i.e., instruments, etc.). (290)

Shieber requires of process reliabilism “only that the notion of process be broadened to include genuinely social belief-forming processes” (290).

<sup>14</sup> Miller also shows that Hyde-like scenarios are not Gettier cases. In short, they are common, not coincidental, and involve blameworthy error, not luck (427-8). He also cites data showing that mathematical journals have higher than expected rates of substantial errors that survive the peer-review process. Grear (2010) and Nathanson (2008) separately argue that this problem has troubling epistemic consequences for the field. Frans and Kosolovsky (2014) and Geist, Loweand, and Van Kerkhove (2010) argue for more stringent conditions for mathematical knowledge acquired through testimony.

<sup>15</sup> Goldberg (2010) offers a good deal of positive motivation too.

<sup>16</sup> Two collections of essays concerned with the epistemology of cognitive externalism are *Philosophical Explorations* 15(2) (2012) and *Philosophical Issues* 24(1) (2014). For the relationship between epistemic internalism/externalism and cognitive internalism/externalism, see Carter *et. al.* (2014). Clark and Chalmers (1998) prompted discussion of cognitive externalism in the philosophy of mind.

<sup>17</sup> Goldberg (2010, 127-132) rightly points out that epistemic extension, being a strictly epistemological claim, does not entail extended cognition. So, to be clear, I am not attributing commitment to cognitive externalism to Goldberg, Miller, or any extensionist besides certain epistemologists of cognitive externalism. Beside Green (2012; 2014), proponents of cognitive externalism cited in this paper endorse epistemic extension only indirectly. They contend that an individual can know that *p* *via* extending her cognition over the cognitive efforts of others.

<sup>18</sup> In correspondence, Miller suggested a similar condition on *S*. Pritchard (2010), like Brogaard, argues that a version of virtue epistemology beside credit theory is compatible with cognitive externalism.

<sup>19</sup> Vaesen (2011b; 2013), Kelp (2013; 2014), and Green (2014) debate the merits of extended credit theory.

<sup>20</sup> Goldberg (2010); (2011); (2012); Fagan (2011; 2012); Shieber (2013); Miller (2015). As noted earlier, Goldberg (2010) does offer some positive motivation.

<sup>21</sup> Thagard (1997; 2010); Giere (2002; 2006; 2007; 2011; 2012); Green (2012; 2014); Kelp (2013; 2014); Brogaard (2014); Palermos (2014; 2016).

<sup>22</sup> Brogaard (2014) places a responsibilist condition on *S*. Green (2012; 2014) places a creditworthiness condition on *S*. Palermos (2014), Clarke (2015), and Wray (2018) compare, on the one hand, *S* extending her cognition over the cognitive efforts of other agents, and on the other hand, *S* competently employing or integrating herself with technology. Palermos argues that these scenarios can be epistemically analogous: in both cases, *S* can competently extend her cognition without having to double-check epistemic materials possessed by others. That is, how technology works need not be transparent to *S* in order for *S* to be able to acquire knowledge by using it. Analogously, the cognitive operations of others need not be transparent to *S* in order for *S* to benefit epistemically from them. Wray disagrees to some

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extent. He contends that *S* must take responsibility for all epistemic materials and that this is complicated in important ways when other agents, as opposed to technological artifacts, are involved.

<sup>23</sup> Ronald Giere (2002; 2006; 2007; 2011; 2012) argues that some knowledge-how is knowledge *via* epistemic extension. He appeals to distributed cognition rather than extended cognition. Both theses involve the idea that cognitive labour extends beyond any one individual. But in cases of distributed cognition, there is no central individual. Giere relies on Ed Hutchins' (1995) famous study of navigation. Giere agrees with Hutchins that the cognitive labour involved in many naval operations, such as a ship entering port, is necessarily distributed across large, complex, organized systems that cannot be internalized by any individual. Yet, Giere resists the claim that knowledge of how to enter port ought to be ascribed to the crew as a whole or, as Knorr-Cetina (1999) and Vaesen (2011a) claim, to the ship as a whole: crew plus artifacts. Giere insists that it is the navigator (and maybe her assistant) who knows. He aims to avoid what he deems unnecessary, inflated social ontology, or "extended epistemic agency," which he targets more pointedly elsewhere (Giere 2007). I argue elsewhere (Dragos 2019) that there cannot be knowledge-how *via* epistemic extension, yet I also argue that groups can possess knowledge-how.

<sup>24</sup> Other than perhaps Fagan (2012, 829), I am not aware of any extensionists who deny the possibility of group knowledge.

<sup>25</sup> So-called "believers" claim that groups have beliefs, while so-called "rejectionists" claim that groups have acceptances. How exactly we ought to conceive of the relevant group states is immaterial for the purposes of this paper. For more on these issues in relation to group epistemology, see Gilbert (1989; 1994; 2000; 2004); Tuomela (1992; 2004); Mathiesen (2006); Wray (2001; 2003; 2007; 2014); Mathiesen (2006; 2011); Staley (2007; 2010); Hakli (2007; 2011); Rolin (2008; 2010); Andersen (2010); Beatty and Moore (2010); Bird (2010; 2014); Bouvier (2010); Baumann (2011); Fagan (2011; 2012); Briggs *et. al.* (2014); Cheon (2014); de Ridder (2014); Gilbert and Pilchman (2014); Tollefsen (2015, chs. 1, 2); Weatherall and Gilbert (2016). On group agency, see List and Pettit (2006; 2011; 2012); Mathiesen (2011); Briggs (2012); Cariani (2012); Pettit (2014); Tollefsen (2015, ch. 3); List (2016). On group personhood, see Kusch (2014); Smith (2018).

<sup>26</sup> Gilbert (1989; 1994; 2000; 2004); Tuomela (1992; 2004); Rolin (2008; 2010); Gilbert and Pilchman (2014). Bird (2010; 2014) and Klausen (2015) reject a group-doxastic-state condition on group knowledge. Their work is relevant in the following section. Until then, I am not directly concerned with differences between accounts of grouphood or group knowledge.

<sup>27</sup> Andersen and Wagenknecht (2013) is another example.

<sup>28</sup> Dragos (2016a; 2016b) are small, exploratory steps into this domain.

<sup>29</sup> If an extensionist is committed to the traditional tenet that only individuals can possess knowledge, she can (in principle) analyze all cases of EIK, including all cases of EIK-D, as individual knowledge *via* epistemic extension. This is why I argue in this section that *if there is group knowledge*, as many contend, then some of it is knowledge *via* epistemic extension.

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<sup>30</sup> As noted earlier, there is disagreement about what counts as a doxastic state or whether certain quasi-doxastic states can satisfy the doxastic-state condition on knowledge. But my argument does not require me to wade into these debates.

<sup>31</sup> I thank a reviewer at *Synthese* for prompting me to clarify that option (2) of Hardwig's dilemma for cases of EIK-D need not pick out plural subjects. What kind of group is picked out will depend on the groups involved in a particular case.

<sup>32</sup> I thank a reviewer at *Synthese* for pointing me to Bird's (2014) and Klausen's (2015) views.

<sup>33</sup> In note 10, I cite philosophers who forward an argument directly from the mere occurrence of EIK to the claim that groups must possess this knowledge, without addressing the possibility that individual knowledge *via* epistemic extension obtains (Vaesen 2011a; de Ridder 2014). This move goes through only if epistemic autonomy is necessary for possessing knowledge. The same is true of the inference drawn by Bird (2014) and Klausen (2015) from the occurrence of EIK-D to the attribution of knowledge to collections across which epistemic materials are diffusely distributed.

<sup>34</sup> Klausen argues that we should be open to dropping the doxastic-state condition on knowledge. But in the process he also considers a drastically weakened condition such that a group *G* knows that *p* only if at least one member of *G* believes (or is disposed to believe) that *p* (827-9). Suppose *G* knows that *p* and just one member *M* of *G* believes that *p*. Klausen calls *M* an *epistemic executive*: "(t)he person forming the 'target' or 'output' belief... [S]he brings the epistemic task to its fulfillment" (827). Epistemic assistants are those who contribute in epistemically salient ways without themselves believing the "output." Neither executives nor assistants are fully aware of all the epistemic labour occurring and how it all works to generate knowledge. Klausen contends that while the epistemic executive might believe the "output," she might not possess knowledge, "since she might not possess the relevant evidence" (*ibid*). She may, in such cases, nevertheless possess a lesser sense of knowledge *via* testimony without possessing all the epistemic materials generating that knowledge. With respect to scientific knowledge, Jeroen de Ridder (2014) argues similarly that one can possess "derivative" or "secondary" knowledge that *p* when "she doesn't have access to all of that non-testimonial evidence herself, because it is partly beyond her cognitive reach... [when] she doesn't fully understand all the evidence for *p* and how it supports *p*..." (48-9). It seems, then, that both Klausen and de Ridder are extensionists: EIK can be possessed (in a sense) by individuals. However, both deem it necessary in cases of EIK to also attribute knowledge to the wider subject: assistants plus executives (plus, perhaps, the wider system in which they are imbedded), to put it in Klausen's terms. The reason that the wider, primary knowledge bearer is needed is that epistemic materials extend beyond any epistemic executive. But extensionists need not treat the possession of knowledge and the possession of the epistemic materials generating it symmetrically. There does not need to be a "primary" knowledge bearer in addition to a dependent or "secondary" or "derivative" knowledge bearer. Along these lines, de Ridder considers whether he has "only shown that the production of scientific knowledge often irreducibly involves collectives, not that knowledge can properly be attributed to or had by collectives" (51). But he thinks this objection "assumes that collectivity in the production of

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knowledge is somehow eliminable once the knowledge is produced and attributed to a subject... Since having scientific knowledge requires satisfying [the epistemic normativity required for knowledge], the collective primarily has scientific knowledge.” (*ibid*). Contrary to de Ridder’s contention, extensionists need not assume “that collectivity in the production of knowledge is somehow eliminable” once knowledge *via* epistemic extension is attributed. de Ridder’s contention works only if knowledge possession entails the possession of all epistemic materials, that is, only if epistemic autonomy is necessary for knowledge. Likewise for Klausen’s contention that the wider collective (i.e. executives, assistants, system, etc.) possesses knowledge in the primary sense.

<sup>35</sup> In an earlier draft of this paper, I took it to be uncontroversial that groups can receive testimony. I thank a reviewer at *Synthese* for pointing out that some would deny that a group *qua* group can be a recipient of testimony. Perhaps a group receives testimony only through its individual members. I do not have the space to offer an account of group reception of testimony. However, I flag this issue and acknowledge that my argument to extensionists is conditional upon a successful account of group reception of testimony.

I claim that if groups can be recipients of testimony, Goldberg’s argument is just as compelling when reformulated at the group-level. However, part of what makes Goldberg’s argument compelling is the analogy he draws between testimonial knowledge and memorial knowledge. A memorial belief that *p* is a belief that is inferred from (or is otherwise saliently dependent upon) a previously acquired belief that *q*. This is also true of many group beliefs (or acceptances). For example, important coordinated measurements were undertaken in 2015 by the CMS and ATLAS Collaborations. The data are co-published by the collaborations in Aad *et. al.* (2015). This work builds upon important measurements taken independently in 2012 by the CMS and ATLAS Collaborations. The data are published in Chatrchyan *et. al.* (2012) and Aad *et. al.* (2012), respectively. Presumably, the coordinated 2015 results depend on the 2012 independent results, such that were a fundamental problem with the 2012 results, this would negate or undercut the 2015 results. So, I think the memory analogue can be drawn at the group level.

<sup>36</sup> This claim, or the claim that groups face unique or more difficult epistemic hurdles, is proposed by Briggs *et. al.* (2014); Wray (2014); Lackey (2016); Weatherall and Gilbert (2016). Margaret Gilbert’s (2000; 2004) well known joint commitment account of group belief has been both criticized (Wray 2001; Mathiesen 2006; Bouvier 2010) and defended (Beatty and Moore 2010) for making group knowledge, especially group scientific knowledge, more difficult to attain than individual knowledge. Some argue to the contrary that group knowledge should not be held to a higher standard (e.g. Klausen 2015).