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GROUP JUSTIFICATION IN SCIENCE

ABSTRACT

An analysis of group justification enables us to understand what it means to say that a research group is justified in making a claim on the basis of evidence. I defend Frederick Schmitt's (1994) joint account of group justification by arguing against a simple summative account of group justification. Also, I respond to two objections to the joint account, one claiming that social epistemologists should always prefer the epistemic value of making true judgments to the epistemic value of maintaining consistency, and another one claiming that the notion of joint commitment implicit in the joint account is epistemically unacceptable.

In recent years a number of philosophers have argued that knowledge can be *properly* attributed to groups (Bouvier 2004; Fallis 2007; Gilbert 2000a; Kusch 2002; Mathiesen 2006; Rolin 2008; Schmitt 1994; Staley 2007; Tuomela 2004; Wray 2001, 2006, 2007). While this thesis may appear to be trivial, it entails the non-trivial view that groups as non-summative collectives, and not merely as summative ones, can have knowledge (Mathiesen 2007). On a *summative* understanding of collective knowledge, to claim that a group G knows that p is merely to offer a shorthand statement of the claim that all or most members of G know that p. On a *non-summative* understanding, the claim that a group knows that p is not equivalent to the claim that all or most group members know that p. As Margaret Gilbert explains, groups can have "beliefs of their own" (2000a, 38).

While many philosophers agree on the view that knowledge can be attributed to groups as non-summative collectives, their views diverge on the question of how collective knowledge is properly conceptualized. The literature on collective knowledge includes controversies on the three components that epistemologists have traditionally included in the analysis of knowledge: truth, belief, and justification. Some philosophers claim that insofar as groups have epistemic goals, their epistemic goal is properly understood as truth (Goldman 2004). Others

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challenge this view by claiming that the epistemic goals of groups are multiple and they cannot be realized at the same time (Fallis 2005, 2007; Staley 2007). Whereas some philosophers stress that collective knowledge involves collective *belief* (Gilbert 2002; Tollefsen 2003), others hold the view that collective knowledge is properly understood to involve collective *acceptance*, not belief (Hakli 2007; Wray 2001). Some philosophers adopt an account of collective *justification* that appeals to the notion of joint commitment (Rolin 2008; Schmitt 1994; Tuomela 2004). Others object to such an account even though they acknowledge the need for a non-summative account of collective knowledge (Mathiesen 2006). Philosophers also debate the question of what kinds of collectives can be subjects of collective knowledge. Whereas some philosophers suggest that whole *communities*, such as scientific communities, can have knowledge (Gilbert 2000a; Rolin 2008), others claim that though some *groups*, such as research teams, can have knowledge, communities cannot (Wray 2007).

My aim is to contribute to the growing literature on collective knowledge by analyzing the notion of group justification. I wish to set aside the belief/acceptance debate as well as the community/team debate and use the terms "view" and "group" to discuss collective knowledge (see also Mathiesen 2006, 162). It will turn out to be the case that the debate on the epistemic goals of groups cannot be set aside because it has implications for the analysis of group justification.

The notion of group justification deserves more attention than it has received so far because the phenomenon of group justification is salient in science. In many areas of contemporary science, research papers are authored by research groups, not by individual scientists (Thagard 1999; Wray 2006). For example, in high energy particle physics a large-scale collaboration can involve up to 450 scientists (Staley 2007, 324). In such cases we want to understand what it means to say that a research group is justified in making a claim on the basis of the evidence presented in its joint paper.

In section 1, I discuss a well-known attempt to conceptualize group justification, Frederick Schmitt's "The Justification of Group Beliefs" (1994). While I agree with Schmitt that a joint account of group justification is the best available account, I raise concerns about his argument. In section 2, I defend Schmitt's account by addressing the concerns I raise in section 1. In section 3, I address yet another objection to Schmitt's account of group justification, the claim that groups that form a joint commitment to accept certain views fail to be epistemically rational (Mathiesen 2006).

1. JUSTIFICATION OF GROUP VIEWS: THE JOINT ACCOUNT

In this section I introduce Schmitt's (1994) joint account of group justification. On the joint account, group justification is not identical to individual justification and cannot be reduced to individual justification. While I agree with Schmitt that the joint account of group justification is the best available account of group

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justification, I show that his argument in favor of the joint account is in need of further elaboration.

Schmitt suggests that we make a distinction between two notions of group justification similar to the way Gilbert (2000a) makes a distinction between two notions of collective belief. What Gilbert calls the *plural subject* account of collective belief involves the notion of joint commitment. To say that a group G as a plural subject believes that p means that the members of G are jointly committed to believe as a body that p (39). A joint commitment creates entitlements and obligations that bind group members at least in those contexts where they act as members of the group. A group member's participation in a joint commitment of the type in question requires her not to deny that p without qualification (44). In case she denies that p without qualification, the other members of the group are in the position to call her on it (40).

According to Gilbert, the plural subject account of collective belief differs from a summative account in an important respect. On the *simple summative* account, a group G believes that p if and only if all or most of the members of G believe that p (39). On the plural subject account, it is neither a necessary nor a sufficient condition for a group to believe that p that all or most of the group members believe that p. Thus, it is possible that a group's view and the group members' personal views diverge. A group may decide to accept jointly a collective view p while all or many of its members are not willing to accept p as their personal view. On the plural subject account, a group believing that p is characterized by an agreement, but it is not an agreement concerning p; rather, it is an agreement to let p stand as the position of the group (see also Beatty 2006, 53).

Schmitt introduces a distinction between a simple summative and a joint account of group justification. On the *simple summative* account of group justification, a group G is justified in believing that p if and only if all or most members of G are justified in believing that p. On the *joint* account of group justification, a group G is justified in believing that p if and only if G has good reasons to believe that p. According to Schmitt, a group G has a reason r to believe that p just in case all members of G would properly express openly a willingness to accept r jointly as the group's reason to believe that p (1994, 265). Schmitt's joint account of group justification is similar to Gilbert's plural subject account of collective belief in that it is based on the notion of joint commitment. To say that group members jointly accept r as the group's reason to believe that p means that they are *jointly committed* to accept r as the group's reason to believe *as a body* that p (Gilbert 1996, 8). It is important to keep in mind that the joint account of group justification is not meant to explicate what it means for a group to have a *good* reason; it is meant to explicate what it means for a *group* to have a reason (Schmitt 1994, 266).

The joint account of group justification differs from the simple summative account of group justification in one important respect. In order for a group G to be justified in believing that p (in the joint sense), it is neither sufficient nor necessary that all or most group members are justified in believing that p. Even if

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all group members are justified in believing that p for the same reason r, it may still be the case that the group is not so justified because the group has not jointly accepted r as the group's reasons to believe that p. Also, all group members being justified in believing that p is not a necessary condition for group justification on the joint account because a group can jointly accept r as a group's reason to believe that p even though some group members do not think that r is a reason to believe that p (274).

Schmitt argues that the simple summative account of group justification is inadequate. Let me explain first his argument against the "if" part in the simple summative account and then his argument against the "only if" part. In Schmitt's view, it is not the case that a group G is justified in believing that p *if* all or most members of G are justified in believing that p. The reason for this is that it is possible to imagine two groups with coextensive membership, one group justified in believing that p and the other one not so justified. Schmitt illustrates his argument with Gilbert's example of two committees, the library committee and the food committee, that, by coincidence, have the same membership (Gilbert 1992, 273). Schmitt invites us to assume also that all members of the two committees are justified in believing that the library holds a million volumes. Nevertheless, it is possible that the food committee fails to be justified in believing that the library holds a million volumes even though all members of the committee are justified in believing the proposition. The food committee fails to be justified in believing the proposition because the food committee does not have good reasons to believe so. And this is possible because the two committees have been formed for different purposes. Thus, they are likely to gather different kinds of evidence and to make judgments about different issues based on these different kinds of evidence (Schmitt 1994, 265).

Also, in Schmitt's view it is not the case that a group G is justified in believing that p *only if* all or most group members are justified in believing that p. The reason for this is that a group G may be justified in believing that p even though some group members are not justified in believing that p. For example, the group might lack reasons against p because these reasons are unavailable or inadmissible for the group even though some group members possess these reasons (274–5).

Schmitt claims that these two arguments against the simple summative account of group justification give support to the joint account (275). However, even if the simple summative account were inadequate, it would not follow that the joint account is the best available account of group justification because group justification can be conceptualized in other ways. It is not difficult to come up with a candidate that is an alternative to both the simple summative and the joint account. We can take group justification to mean that a group G is justified in believing that p just in case all members of G are justified in believing that p for the same reasons and it is common knowledge in the group that they are so justified. Let me call this view the *reflective summative* account of group justification in order to distinguish it from the simple summative account. On the reflective summative

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account, a group G can have justified views only under certain conditions, when there is a summative consensus on a view and its supporting reasons, and a common awareness of such a consensus in the group. Whatever the merits of this alternative account are, the mere possibility of having an alternative account means that Schmitt's argument for the joint account of group justification is far from being complete. It is not sufficient to show that the simple summative account is inadequate. One will also have to show that the joint account is the best available account of group justification.

Moreover, Schmitt's argument against the simple summative account might strike one as being question-begging because it presumes the joint account of group justification. When he argues that the food committee is not justified in believing that the library holds a million volumes because the food committee does not have good reasons to believe so, he appeals to the joint account of group justification. Thus, his argument appears to beg the question of why the joint account is superior to alternative accounts of group justification.

In summary, Schmitt argues that the simple summative account of group justification is inadequate because we can imagine two coextensive groups that do not have the same justified beliefs. This argument is convincing to the extent that we are already inclined to accept a non-summative account of group justification. However, it is not yet clear why we should accept one. Nor is it clear why we should accept an account of group justification that appeals to the notion of joint commitment. In the next section I defend Schmitt's joint account of group justification by addressing these concerns.

2. THE DISCURSIVE DILEMMA: LESSONS FOR GROUP JUSTIFICATION

In this section, I introduce the so-called "discursive dilemma" (Pettit 2003) in order to clear away the concerns I have raised in the previous section. The discursive dilemma enables me to construct two arguments, one argument against the simple summative account of group justification and another argument for the claim that the joint account of group justification is the best available account.

While I offer a novel argument against the simple summative account, my argument builds on the central insight in Schmitt's "The Justification of Group Beliefs" (1994), the idea that we can imagine two coextensive groups that do not have the same justified beliefs. I use the discursive dilemma to demonstrate that group justification differs from individual justification in that it involves not merely reasoning but also an aggregation procedure. By an aggregation procedure, I mean a mechanism for aggregating group members' individual views into corresponding collective views endorsed by the group as a whole (List 2005, 25). The discursive dilemma offers a simplified and schematic way to demonstrate what follows if we adopt the simple summative account of group justification. I argue that the simple summative account is inadequate because it implies the possibility that a group

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Table 1. Group consistency compromised.

	p	q	p & q
person A	T	F	F
person B	F	T	F
person C	T	T	T
group view	**T**	**T**	**F**

is justified in accepting a contradiction in its views. If we hold on to the view that consistency is a necessary condition of having justified views, for individuals as well as for groups, then we should not accept the simple summative account. My argument against the simple summative account is more conclusive than the one presented by Schmitt because it does not presume the joint account of group justification.

Let me explain the argument in more detail. The discursive dilemma enables us to see the range of options logically possible for a group when it aggregates its members' individual views into a collective view. Let us assume that a group G_3 includes three persons, A, B, and C, and that each member of the group is competent in deductive reasoning. Let us assume also that the task at hand is to find out whether the group G_3 is justified in believing that (p & q) is true given that each group member has already made her individual judgments concerning the truth values of p and q. If we adopt the simple summative account of group justification, then we will have to find out whether three or two members of the group are justified in believing that (p & q) is true in order to know whether the group G_3 is justified in believing it. For example, if each group member believes that p is true and q is true, then each group member is justified in believing that (p & q) is true. On the simple summative account, it follows that the group G_3 is justified in believing that (p & q) is true.

Consider the case where the group members disagree about the premises, and nevertheless, they want to arrive at a collective view (see table 1). If two members of the group (A and B) are justified in believing that (p & q) is false, then the group G_3 is justified in believing that (p & q) is false. It is also the case if two members of the group (A and C, for example) are justified in believing that p is true and two members of the group (B and C, for example) are justified in believing that q is true, then the group G_3 is justified in believing that p is true and q is true. On the simple summative account, it is possible that a group is justified in believing an inconsistent set of propositions: p, q, and not (p & q). I argue that we should not accept the simple summative account because of this implication. Consistency in a set of views is a necessary condition of having justified views, for both individuals and groups. For example, a scientific paper is expected to be consistent independently of whether it is authored by an individual or a group.

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Table 2. Conclusion-centered procedure.

	p	q	p & q
person A	T	F	**F**
person B	F	T	**F**
person C	T	T	**T**
group view	-	-	**F**

Table 3. Premise-centered procedure.

	p	q	p & q
person A	T	F	-
person B	F	T	-
person C	T	T	-
group view	**T**	**T**	**T**

The discursive dilemma enables us to see how groups can block the possibility of inconsistent group views. Groups like G3 can choose among different aggregation procedures in order to arrive at a collective view without risking inconsistency. For example, in the conclusion-centered procedure the group members conduct reasoning individually and after each of them has reached an individual conclusion they aggregate their view by means of a majority vote (see table 2).

In the premise-centered procedure the group members aggregate their views on each premise and after settling on a majority view, they conduct reasoning from the group premises to the group conclusion (see table 3). The discursive dilemma has generated much debate because the two procedures, at least on the face of it, seem to be equally reasonable ways to arrive at a collective view, and nevertheless, they lead to conflicting outcomes.[1]

Philip Pettit (2003) argues that the discursive dilemma is properly understood as a dilemma, rather than a paradox, because it shows that a group has to make a decision between two options. The group has to choose between the possibility of inconsistency in group views and the possibility of sacrificing potentially important information. The conclusion-centered and premise-centered procedures enable the group to avoid inconsistency, but they require the group to sacrifice information. The conclusion-centered procedure omits information on collective premises (table 2) and the premise-centered procedure omits information on individual conclusions (table 3). As Pettit explains: "You can have individual responsiveness or collective rationality but you cannot have both – or at least you cannot have both for sure" (174).

Alvin Goldman (2004) argues that if one cannot always have individual responsiveness and collective rationality at the same time, then so much the worse for collective rationality. In his view, social epistemology should remain in the tradition where knowledge is thought to be true belief arrived at via

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reliable methods, means, or sources (11). For this reason, Goldman argues, social epistemologists should always prefer methods that track true beliefs to methods that guarantee collective rationality (15). If Goldman is right, his view undermines my attempt to argue that the simple summative account of group justification is inadequate.

Contrary to Goldman's view, I argue that we should not take a general stand against or for collective rationality. Whether the epistemic value of making true judgments trumps the epistemic value of maintaining consistency is to be decided on a case-by-case basis (see also Fallis 2005). While it can be argued that the epistemic goal of science is to achieve significant truths (Kitcher 2001), it can be argued also that science includes a number of practices that have intermediate epistemic goals. An intermediate epistemic goal can be attributed to an individual scientist when she aims to do her part in a division of labor in a research team, or to a group that aims to achieve a goal that it sees as instrumental to achieving its long-term epistemic goals.

Collective rationality is an intermediate epistemic goal in science insofar as scientific research requires collaboration. In order for research groups to be able to continue their research, they need to strike a balance between two aims. On the one hand, they seek to avoid making false claims, and on the other, they seek to make novel and significant true claims (Staley 2007, 323). The pressure to publish novel and significant results means that groups are under pressure to aggregate individual views into collective ones. An individual scientist can ask that her name is removed from the list of authors if she does not personally agree with the argument in the joint paper and she is not willing to let the argument stand as the position of the group (325). But it is not an option for a group to knowingly send an inconsistent paper to a journal and expect it to pass the review process. I will discuss Goldman's objection in greater detail later, in section 3.

So far I have argued that we should not accept the simple summative account of group justification because it leads us to compromise collective rationality. I do not claim that the epistemic value of maintaining consistency always trumps the epistemic value of making true judgments. But I claim that it sometimes does.

Let me turn to my second argument. I argue that the joint account of group justification is the best available account of group justification because it has certain advantages over other accounts. One rather obvious advantage is that the joint account makes it possible for groups to have justified views when a summative consensus on a view is not feasible within a given time frame. A less obvious advantage is that the notion of joint commitment offers a plausible account of how groups are capable of following an aggregation procedure successfully.

Let me explain the first advantage. The joint account of group justification enables us to conceive of how a research group can have a justified view even when there is dissent concerning the view in the group. Unlike summative accounts, the joint account does not require that there be a summative consensus on the group's view. This feature is significant when we consider papers authored by large research

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groups. Large collaborations often achieve what William Rehg and Kent Staley (2008) call a "heterogeneous consensus." Such a consensus obtains when group members agree on the conclusion of the argument, but they disagree as to what evidence is relevant or how that evidence supports the conclusion. When there is a disagreement concerning some views, group members have at least four options. One option is that they suspend judgment on the contested view. Another option is that they accept dissent as a temporary state of affairs and postpone taking any steps to form a consensus. Yet another option is that they undertake a process of deliberation with the aim of achieving a summative consensus. A fourth option is that they take steps towards forming a non-summative collective view when a summative consensus is not feasible within a given time frame. When research groups are under pressure to publish novel and significant results, the fourth option is attractive. As Staley explains, "for practical purposes, the ability to make such claims *requires* a willingness to make compromises between the individual members' beliefs and the belief statement of the group" (2007, 324).[2]

Next, let me explain the advantage in the notion of joint commitment that is implicit in Gilbert-style collective beliefs and Schmitt-style group justification. The discursive dilemma shows that if group members want to block the possibility of inconsistency in their group views, they have to "collectivize reason" (Pettit 2003, 176), that is, to accept an aggregation procedure and follow it in their decision making. The aggregation procedure should define *which members* of the group are allowed to have a say on which premises in the formation of group views. The aggregation procedure should define also *how* the relevant group members' views are aggregated, for example, by using a majority vote or some other kind of method. Moreover, the aggregation procedure should define *when* the relevant group members' views are aggregated, for example, by aggregating individual premises or individual conclusions.

The notion of joint commitment has the advantage that it enables us to understand how a group is capable of following an aggregation procedure successfully. Indeed, it is hard to see how else a group could follow an aggregation procedure successfully except by forming a joint commitment to follow such a procedure. Whereas group members can conduct reasoning individually, the aggregation of individual views into a collective view cannot be done individually. It has to be done by the group jointly as a body.

I argue that an aggregation procedure is best thought of as a social rule if we want to understand how a group can follow such a procedure successfully. An aggregation procedure can be expressed in the general form of a social rule: "Group members are to do x in circumstances y," where x specifies the procedure and y the relevant circumstances (Gilbert 2000b, 84). An aggregation procedure functions as a social rule insofar as group members are jointly committed to accept the procedure as a body. As Gilbert argues, the notion of joint commitment explains two features that are thought to belong to social rules: social rules generate obligations and a sense of being bound by such obligations (86–7). The notion

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of joint commitment generates obligations that bind group members in at least those contexts where they act as members of the group. It does not, of course, follow from the fact that a group member is party to a joint commitment that she will conform to it. However, it follows that a group member is obligated to other members to conform to the rule and that other members have a right to rebuke her in case she does not conform to the rule (86).

In order for a group to follow an aggregation procedure successfully, a sense of being bound by an obligation is crucial because group members cannot anticipate the outcome of the procedure easily. An individual group member should have a sense of being bound to accept a view as the position of the group even when she does not accept it as her personal position. The notion of joint commitment has the advantage that it explains how group members come to have a sense of being bound to accept the outcome of the procedure. Indeed, the concept of joint commitment makes it possible for group members to say that "we have accepted the rule for us" (Gilbert 2000b, 86). These features of social rules enable us to understand how a group is capable of following an aggregation procedure successfully even when not all group members personally agree with the outcome of the procedure.[3]

In summary, I have argued that the simple summative account of group justification is unacceptable because it implies the possibility that a group is justified in accepting an inconsistent set of views. On the simple summative account, groups would have to choose between two unsatisfactory options. One option is that a group is required to have a summative consensus on many views before it can claim to be justified in accepting a view. This option is unsatisfactory because it makes it difficult to understand how a group with a "heterogeneous consensus" can arrive at a justified view within a reasonable time frame. Another unsatisfactory option is to give up the view that consistency is a necessary condition for having justified views. I have argued also that the joint account of group justification is the best available account of group justification because it enables us to understand how a group can follow an aggregation procedure successfully. A group's joint commitment to accept an aggregation procedure as a body elevates a mere procedure to a social rule that generates obligations and a sense of being bound by such obligations. In the next section I defend the joint account of group justification by responding to yet another objection to the view.

3. THE JOINT ACCOUNT OF GROUP JUSTIFICATION: CRITICISM AND DEFENSE

Even though Kay Mathiesen (2006) does not address Schmitt's joint account of group justification explicitly, her discussion of collective knowledge threatens to undermine the joint account. Mathiesen argues that we should not appeal to the notion of joint commitment in our attempts to conceptualize collective knowledge because groups that have jointly committed themselves to accept views are unlikely

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to be epistemically rational. Contrary to Mathiesen's view, I argue that a group's joint commitment to accept a view as a body can be epistemically rational even on the account of epistemic rationality endorsed by Mathiesen herself. The reason for this is that epistemic rationality is a more complex matter than what Mathiesen assumes.

Mathiesen's argument is based on a conception of epistemic rationality that is different from the notion of collective rationality introduced in the previous section, that is, collective rationality as the consistency of collective views. According to Mathiesen, a group G is *epistemically rational* if and only if G takes the steps that can reasonably be expected to help it achieve its epistemic goals (2006, 165). I call her account of epistemic rationality *instrumental* for reasons that I will explain below. Moreover, according to Mathiesen, a group can be epistemically rational in a subjective or an objective sense (or both). A group G is *subjectively* epistemically rational if and only if G has the goal of believing truths and avoiding falsehoods and abides by epistemic practices that G believes to be effective in achieving that goal. A group G is *objectively* epistemically rational if and only if G has the goal of believing truths and avoiding falsehoods and abides by epistemic practices that are effective in achieving that goal (165–6). It is important to notice that on Mathiesen's account, epistemic rationality is primarily a feature of groups and only secondarily a feature of group views. In order for a group view to be epistemically rational (in an objective sense), it must be formed by the group in a practice that is effective at getting at truth (169).

Mathiesen argues that groups that have Gilbert-style collective views are unlikely to be epistemically rational (in an objective sense) because they have had to adopt practices that are not effective at getting at truth. Recall that a group's joint commitment to accept a view as a body generates obligations and entitlements among group members. Once a group member has openly expressed a commitment to jointly accept a view as the position of the group, she is obligated not to question the group position even if she believes it is false. Therefore, Mathiesen argues, the joint commitment required for the formation of a collective view provides group members with a non-epistemic reason for asserting and supporting a proposition. Mathiesen claims that appealing to such non-epistemic reasons as obligations created by joint commitments is against the epistemic goals of any group that aims to form true beliefs and avoid false ones. As she explains it: "It seems that, from the epistemic point of view, not only should group members be *permitted* to question the group belief, they are *obligated* to do so if they think it is false or poorly supported by the evidence" (169).

Mathiesen argues that the notion of joint commitment is problematic from an epistemic point of view even if we acknowledge that obligations created by joint commitments are context-bound. According to Gilbert, group members are obligated not to contradict the group view when acting as members of the group, but they are not violating joint commitments if they voice disagreements *in propria persona* (2004, 104). Mathiesen argues that the notion of joint commitment is

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epistemically suspect even in this case because the group will not be able to benefit from the dissenter (2006, 169). As Mathiesen explains, "If I have what I consider to be compelling reasons to reject the group view, then by voicing my rejection and presenting my reasons, I am helping us move toward the truth" (171).

Contrary to Mathiesen's view, I argue that a group's joint commitment to accept certain views as a body can be epistemically rational. My argument has two parts. First, I argue that Mathiesen's conception of epistemic rationality is based on a contested view about the epistemic goals of groups, the view that truth is an overriding epistemic goal. Second, I argue that even if we grant to Mathiesen that a group's epistemic rationality is a function of whether the group's practices are effective at taking the group towards the truth, it does not follow that the notion of joint commitment is epistemically unacceptable.

My first argument takes off where I left my controversy with Goldman (2004). The conclusion from the argument against Goldman's conception of social epistemology is that the epistemic value of making true judgments does not always trump the epistemic value of maintaining consistency. The reason for this is that research groups have other epistemic goals besides truth and sometimes these other epistemic goals override truth. Insofar as collective rationality is an epistemic value for groups, groups can benefit from practices whereby they jointly accept an aggregation procedure and decide to follow it.

While I do not reject the view that one epistemic goal in science is to achieve significant truths, I argue that another epistemic goal in science is *epistemic justification*. The goal of epistemic justification helps us understand why we can observe what Jutta Schickore calls "the mismatch between what scientists do and what they state they did when they communicate their findings in their publications" (2008, 323). Scientists are engaged in a number of material practices whereby they represent and intervene in natural processes (Hacking 1983). Scientists design and perform experiments, develop instruments to make observations and measurements, interpret data, and construct models and simulations. Scientists publish their findings in venues that are designed for the purpose of communicating research results to a scientific community. However, conference presentations and journal papers do not give an exhaustive, detailed account of how scientists have obtained their results. The goal of epistemic justification helps us understand why there is a mismatch between "doing science" and "writing science." As Schickore explains, scientists "present their findings embedded in a web of arguments and reasons, thereby changing the order and justification of their research steps" (2008, 323).

Insofar as epistemic justification is an epistemic goal for a research group, the group's joint commitment to accept certain views as a body is not epistemically irrational or arational. The reason for this is that the group has to worry about collective rationality.

However, even if we grant to Mathiesen that truth is an overriding goal for groups as well as individuals, it does not follow that the notion of joint commitment

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is epistemically suspect. Mathiesen is right to point out that a group's joint commitment to accept a view as a body creates an obligation not to contradict the group view in certain situations, and thus it gives an individual group member what appears to be a non-epistemic reason to accept a view that she may personally consider as false. This practice appears to be in contradiction with the goal of achieving true views and avoiding false ones. However, there does not need to be such a contradiction.

In order to understand why this is the case, it important to notice that Mathiesen appeals to a conception of epistemic rationality that is *instrumental* (Solomon 2001). According to Mathiesen, a group is epistemically rational in an objective sense when it follows a line of action that is effective at achieving its epistemic goals. This conception of epistemic rationality is instrumental in the sense that the *consequences* of the group's actions determine whether the group is epistemically rational. An instrumental conception of epistemic rationality does not offer *a priori* criteria to distinguish epistemic reasons from non-epistemic ones. Reasons can be epistemically rational as long as they are conducive to truth under some circumstances. So, if we adopt an instrumental conception of epistemic rationality, then the distinction between epistemic and non-epistemic reasons is not as clear-cut as Mathiesen assumes. Reasons that appear to be non-epistemic, such as an obligation created by a joint commitment, may turn out to be epistemic after all if they help a group achieve its long-term epistemic goals.

Mathiesen does not object to the claim that there are Gilbert-style collective views; she objects merely to the claim that such views play a role in collective *knowledge*. She grants that joint commitments are necessary for a number of persons to form a group. In her view, joint commitments can pertain to the practices and values of groups but they should not include a "commitment to believing propositions" (2006, 171). Contrary to Mathiesen's view, I argue that while we can distinguish "practices" from "propositions" the way she does, "practices" and "propositions" are not independent of each other. If a group G is jointly committed to accept an aggregation procedure as a body (a "practice"), then G is jointly committed to accept the outcome of the procedure as the position of the group (a "proposition").

As I have argued in the previous section, attending to an obligation created by a joint commitment is epistemically rational under some circumstances. In order for a research group to be able to continue its research, it needs to publish novel and significant results under considerable time pressure. It is not uncommon that large research groups decide to publish their results even when not all group members agree on all the details in the paper. The justification for such a decision may appear to be pragmatic rather than epistemic (Staley 2007; Wray 2001). But given an instrumental account of epistemic rationality, the justification is epistemic (and not merely pragmatic) insofar as the decision serves the group's long-term goal to achieve true beliefs.

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To summarize, I have argued that epistemic rationality is a more complex matter than what Mathiesen assumes. While truth is an epistemic goal in science, it is not always an overriding epistemic goal. Insofar as epistemic justification is a research group's goal, the group should aim to maintain consistency in its collective views. And insofar as the group is concerned with collective rationality, its joint commitment to accept certain views as a body is likely to be epistemically rational. I have argued also that if we accept the instrumental conception of epistemic rationality that Mathiesen recommends, then the distinction between epistemic and non-epistemic reasons is not clear-cut. Even those reasons that have traditionally been conceived as non-epistemic, such as an obligation created by a joint commitment, can play an epistemically rational role in a research group's practice.

4. CONCLUSION

I have argued that the joint account of group justification is the best available account of group justification because it helps us understand how large research groups can have justified views. While many collective knowledge attributions in science can be accounted for by a summative account, in some instances a summative account will not do. On the research frontier, research groups proceed to publish their results even when not all group members agree on all the details in the group's argument. On the joint account, it is possible to say that the Collider Detector at Fermilab Collaboration is justified in its claim to have discovered evidence for the existence of the top quark (Staley 2007, 324). On a summative account, the collaboration could not have been justified in its claim.

I have defended the joint account of group justification against a number of objections, some of which I have raised myself (in section 1), and some of which can be found in Goldman's (2004) and Mathiesen's (2006) discussions of collective knowledge. I have shown that Schmitt's (1994) argument against the simple summative account of group justification can be seen as question-begging because it presumes the joint account. As a response to this concern, I have introduced the discursive dilemma to argue that (1) the simple summative account is inadequate because it leads groups to compromise collective rationality, and (2) the joint account is the best available account of group justification because it helps us understand how a group can follow an aggregation procedure successfully. Contra Goldman, I have argued that social epistemologists should be concerned not only with the epistemic value of making true judgments but also with the epistemic value of collective rationality. Contra Mathiesen, I have argued that a group's joint commitment to accept a view as a body can be epistemically rational even on the account of epistemic rationality that Mathiesen herself endorses.

The main lesson is that the notion of group justification challenges common assumptions about epistemic rationality. It forces us to reflect on the question of

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whether epistemic rationality is to be defined with respect to truth or some other epistemic goal, such as epistemic justification, and whether truth should sometimes be risked in favor of collective rationality.

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NOTES

1 A group can avoid inconsistency in its collective views by adopting a division of labor. On a "distributed premise-based procedure" (List 2005, 29), individual members or subgroups specialize on different premises and give their judgments only on these premises. A collective view is based not on all members' individual judgments on all the premises but on the judgments delivered by the "experts" in the group.

2 Pressure to appear credible in front of stakeholders can also give scientists a reason to form a non-summative collective view (Beatty 2006). By stakeholders of scientific knowledge, I mean outsiders who have an interest in scientific knowledge. Stakeholders can include not only potential users of scientific knowledge but also scientists in other disciplines. Medical consensus conferences, for example, are typically staged for stakeholders with the purpose of giving policy recommendations and defining best practices. Such conferences can settle for a non-summative consensus when a summative consensus is not feasible within a given time frame.

3 There are, of course, other kinds of obligations than the ones generated by joint commitments. For example, it can be argued that human rights generate moral obligations that bind all of us as human beings. But insofar as there is an obligation to follow an aggregation procedure, this obligation is more likely to be grounded on a joint commitment than universal moral principles.

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