

Three kinds of collective attitudes

Christian List

Abstract: This paper offers a comparison of three different kinds of collective attitudes: aggregate, common, and corporate attitudes. They differ not only in their relationship to individual attitudes – e.g., whether they are “reducible” to individual attitudes – but also in the roles they play in relation to the collectives to which they are ascribed. The failure to distinguish them can lead to confusion, in informal talk as well as in the social sciences. So, the paper’s message is an appeal for disambiguation.

1. Introduction

We frequently ascribe intentional attitudes, such as beliefs and preferences, not just to individuals, but also to collectives. We speak of what the opinion of a jury is, what the electorate prefers, what Amnesty International is committed to, what Google wants, what the government intends, what the community of scientists thinks, what the markets expect, what “ordinary folk” believe and prefer, and so on (for discussions of collective attitudes of various kinds, see, e.g., Arrow 1951/1963, Quinton 1975, Gilbert 1989, Pettit 2001, ch. 5, 2003a,b, List and Pettit 2002, 2011, Tollefsen 2002a,b, Goldman 2010, Dietrich and List 2010, Schweikard and Schmid 2013).

Ascriptions of attitudes to collectives occur not only in informal talk. They also occur in the social sciences: for example, in the study of cultures, identities, and social norms; in explanations of how groups or societies solve coordination and equilibrium-selection problems; in the theory of the firm, where firms and corporations are often modelled as unitary actors with beliefs and preferences of their own; in international-relations theory, where entire states are sometimes modelled as unitary agents with objectives and beliefs (as in game-theoretic models of the Cold War); in social choice theory, which investigates the aggregation of individual preferences and judgments into collective ones and looks at whether such collective attitudes can be “rational”; and in the literature on joint intentions, the intentions underpinning joint actions, such as going for a walk together, carrying a piano downstairs together, collaborating on a shared project (see, among others, Gilbert 1989, Searle 1995, Bratman 1999, and Tuomela 2007).

What are collective attitudes? Are they just summaries of individual attitudes, or are they held by collectives as agents in their own right? And do all collective attitudes fall under the same kind, whether held by the US Supreme Court, the current generation of teenagers, the collaborators in a project, or the financial markets? Or are there different kinds of such attitudes?

The aim of this paper is to offer a comparison of three different kinds of collective attitudes. I call them “aggregate”, “common”, and “corporate attitudes”. Common usage often vacillates between them. As I will argue, attitudes of the three kinds differ not only in their relationship to individual attitudes – especially in whether and how they are “reducible” to individual attitudes – but also in the roles they play in relation to the collectives to which they are ascribed. For example, only common and corporate attitudes play direct social roles within the collectives in question, while aggregate attitudes need not be more than constructs made by an observer. Further,

only corporate attitudes carry a commitment to group agency, while aggregate and common attitudes can be ascribed to collectives independently of their agential status.

Of course, like all intentional attitudes, each of the three kinds of attitudes can be subdivided further into a variety of subcategories: cognitive and conative attitudes, as well as more complicated types. There can be aggregate beliefs and desires, common beliefs and desires, and corporate beliefs and desires. Each of these, in turn, could be binary (such as a belief or desire *simpliciter*) or come in degrees (such as a *degree* of belief or desire). Similarly, there can be aggregate fears and hopes, common fears and hopes, and corporate fears and hopes. The taxonomy of collective attitudes on which I am focusing here does not replace existing taxonomies of intentional attitudes but simply emphasizes a dimension that is not appreciated as widely as it should be: the aggregate-common-corporate dimension.

The failure to distinguish the three kinds of collective attitudes can lead to confusion, in informal talk as well as in the social sciences. So, the main message of this paper is an appeal for disambiguation. Sections 2, 3, and 4 focus on aggregate, common, and corporate attitudes, respectively. Section 5 offers some concluding remarks. Although the paper is, to a large extent, a review of existing work, I hope the comparison between the three kinds of collective attitudes will prove useful.

2. Aggregate attitudes

2.1 Definition

The first kind of collective attitude is well described in an often-quoted passage by Anthony Quinton (1975, p. 17):

“Groups are said to have beliefs, emotions and attitudes ... But these ways of speaking are plainly metaphorical. To ascribe mental predicates to a group is always an indirect way of ascribing such predicates to its members ... To say that the industrial working class is determined to resist anti-trade union laws is to say that all or most industrial workers are so minded.”

In line with Quinton’s remarks, an *aggregate attitude* (of a collective) is an aggregate or summary of the attitudes of the individual members of the collective, produced by some aggregation rule or statistical criterion. (Gilbert 1989, following Quinton, calls such attitudes *summative*.) For example, if the attitudes to be aggregated are beliefs on some proposition p , and the aggregation rule is the majority rule, then the aggregate belief on p is the majority belief on p . So, p is believed in aggregate if and only if a majority of the individuals believe p . Similarly, if the attitudes to be aggregated are credences (degrees of belief) in p , and the aggregation rule is the linear average, then the aggregate credence in p is the linear average of the individuals’ credences in p .

Depending on the types of attitudes to be aggregated (e.g., whether they are binary or come in degrees), a number of different aggregation rules are available, for instance sub-, simple-, and super-majoritarian rules, linear and geometrical averages, and median rules. It should be clear that the aggregate attitudes of a collective always depend on the aggregation rule used.

We make ascriptions of aggregate attitudes, for example, when we say that the community of climate scientists believes in human-induced climate change, that the current generation of teenagers likes Facebook, or that the markets expect the value of Apple stocks to go down. Aggregate attitudes are frequently referred to in political science and sociology, where *public opinion*, for instance in politics, is understood as the aggregate of individual opinions on the relevant issues.

2.2 Direct versus behavioural aggregation

There are two ways in which we may arrive at aggregate attitudes: through *direct aggregation* and through *behavioural aggregation*. In the case of direct aggregation, the aggregate attitudes of a collective are determined, directly, as a function or summary statistic of the corresponding individual attitudes. This is the familiar route by which we ascribe aggregate attitudes to populations on the basis of votes, opinion polls, surveys, or focus groups. Here, individual attitudes are elicited and then explicitly summarized. Direct aggregation has been extensively studied in public-opinion research, in theories of judgment aggregation and belief merging, and in social choice theory more generally; consequently, I need not say much about it here (for a survey, see List 2013; see also Dietrich and List 2010).

Behavioural aggregation is perhaps less familiar. In this case, the aggregate attitudes are determined, not directly as a function of the corresponding individual attitudes, but indirectly, as an “emergent” property of the individuals’ patterns of behaviour, which, in turn, may reveal their attitudes. The best-known examples of behavioural aggregation can be found in prediction markets and financial markets more generally (on prediction markets, see, e.g., Sunstein 2006 and Hanson 2013). Here the aggregate beliefs and preferences of the market are reflected in market prices. For example, companies which are considered more desirable or which are believed to produce higher future revenues tend have higher stock prices than companies with a weaker standing in people’s opinions.

Since behavioural aggregation is less well known than direct aggregation, it is worth giving an example: the Iowa Presidential Election Market. In the run-up to each United States presidential election, participants in this market can buy and sell bets on the election outcome. For example, a Democratic bet yields a payoff of 1 US\$ after Election Day if the Democratic candidate wins and a payoff of 0 US\$ otherwise. A Republican bet yields a payoff of 1 US\$ if the Republican candidate wins and a payoff of 0 US\$ otherwise.

Figure 1 (from the webpage of the 2012 Iowa Presidential Election Market) shows the market prices of the Democratic and Republican bets between January 2011 and Election Day in November 2012. The market prices for each bet fluctuated considerably over time, depending on how market participants viewed the candidates’ prospects. For instance, when Obama was perceived to do worse than Romney in the first televised debate between the two, the price of the Democratic bet went down and that of the Republican bet went up, reflecting a change in the market’s beliefs about the candidates’ prospects. During most of the campaign, however, the Democratic bet had a higher price than the Republican one.

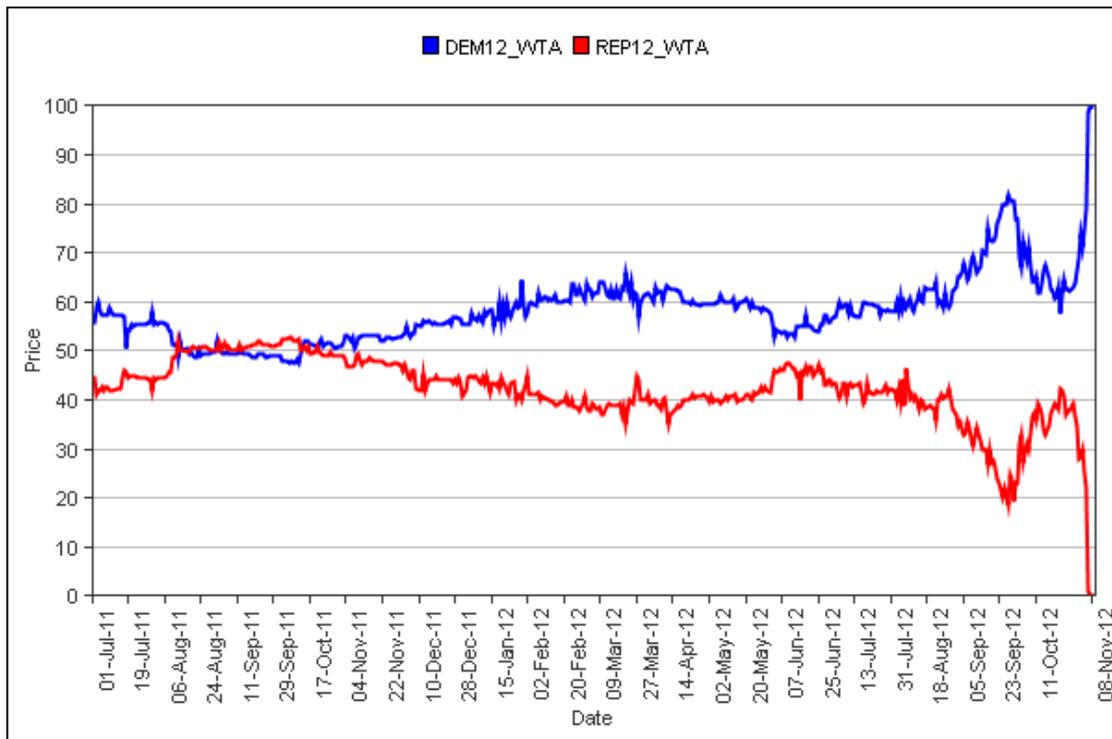


Figure 1: Market prices of the Democratic (top curve) and Republican (bottom curve) bets in the run-up to the 2012 US Presidential Election
 (Source: http://iemweb.biz.uiowa.edu/graphs/graph_PRES12_WTA.cfm)

It is easy to see how the price at which market participants are willing to buy or sell each bet reflects a subjective probability (credence) for the proposition that the relevant candidate will win. Suppose you are one of the market participants in the run-up to the election, and you assign a subjective probability of x (a real number between 0 and 1) to the event that Obama will win. Your expected payoff for the Democratic bet will then be

$$x \text{ US\$} = x * 1 \text{ US\$} + (1-x) * 0 \text{ US\$}.$$

If x is 0.6, for example, your expected payoff for the Democratic bet will be 60 cents. Consequently, if you are a risk-neutral expected payoff maximizer (as we here assume for simplicity), you will be willing to pay up to 60 cents for the Democratic bet, and you will be willing to sell it for no less than 60 cents. Your decision to buy or sell the bet is thus, in part, indicative of your degree of belief in the proposition that Obama will win. The bet's overall market price can be interpreted as reflecting the market's aggregate credence in that proposition: a price of 50 cents, for instance, as reflecting a credence of $\frac{1}{2}$. The more likely Obama's victory looked prior to the election, the more the price approximated 1 US\$, reflecting a credence approximating certainty.

Prediction markets can, in principle, be designed for any proposition that has a verifiable truth-value at some future time. Ideally, this truth-value should be exogenously determined, rather than influenced by the market participants themselves, but I will set this complication aside. Prediction markets can also be designed for "compound" propositions, with logical connectives such as "and" and "or", not just for "atomic" propositions, without such connectives. For example, the conjunctive proposition that Obama will win the election *and* Apple stocks will

increase in value on Election Day has a verifiable truth-value, just as each individual conjunct does. So, we can easily design tradable bets on such conjunctive propositions too.

The aggregate beliefs generated through prediction markets may differ from those that would result from direct elicitation of individual beliefs. On the one hand, such discrepancies need not be a bad thing. Prediction markets may generate incentives for the best-informed individuals to participate, because they are more likely than others to expect a profit, especially if they have private information relevant to the propositions on which they are betting. So, prediction markets may be good at “extracting” dispersed information from a collective. On the other hand, prediction markets can be vulnerable to bubbles as much as ordinary financial markets are, and decisions to buy and sell bets may reflect beliefs about other participants’ beliefs as much as they reflect beliefs about the propositions at hand.

2.3 Strategy-proof aggregation

Strictly speaking, there is an element of behavioural aggregation even in the way we operationalize direct aggregation through voting or opinion polling. Since we never have direct access to people’s attitudes – we cannot look directly into their minds – we must always rely on what people tell us about their attitudes, through votes or speech acts more generally. Whether people’s expressed attitudes match their true attitudes depends on a variety of factors, such as whether they have an incentive to misrepresent their attitudes in order to swing the aggregate attitudes in a direction they consider advantageous.

A key question in the theory of mechanism design in economics is how to design aggregation rules or more generally institutional mechanisms – both in the operationalization of direct aggregation and in behavioural aggregation – so as to incentivize individuals to reveal their attitudes truthfully. An aggregation rule is called *strategy-proof* if it has the property of inducing truthfulness. It is called *manipulable* or *vulnerable to strategic behaviour* otherwise (for discussions, see, e.g., Gibbard 1973, Satterthwaite 1975, Dietrich and List 2007, List and Pettit 2011, ch. 5).

For example, the *median rule* in direct aggregation, under which the aggregate attitude is the median of the individual attitudes (on some commonly accepted linear scale), is known to be strategy-proof under plausible assumptions (e.g., Moulin 1980, Barberà, Gul, and Stacchetti 1993). By contrast, the *plurality rule*, under which the aggregate attitude is the attitude held by the largest number of individuals, is vulnerable to strategic behaviour when there are three or more possible attitudes on a given issue, say attitudes A, B, and C. An individual whose attitude is not one of the two most frequently supported ones (say he or she has attitude C, while A and B are the “front-runners”) might strategically express his or her support for attitude B, in order to prevent A (which he or she supports less than B) from being declared the aggregate attitude.

2.4 The roles played by aggregate attitudes

Although aggregate attitudes may sometimes be very important, such as in elections or high-stakes polls, they need not play any *direct* social roles within the collectives to

which they are ascribed. They are, in the first place, shorthand summaries of the underlying individual attitudes and need not generally be action-guiding for the collective or its members. Aggregate attitudes can of course play important roles *indirectly*, for example when a third party acts on their basis, or when there is some institutional structure in which they play a specified role, or when they are salient in the individuals' eyes. In each of these cases, however, it is only in the presence of some additional conditions (the actions of a third party, the presence of a particular institutional structure, a social norm or criterion of salience) that aggregate attitudes may attain a special functional role.

Indeed, the collective in question need not be engaged in any joint activities at all, let alone conceptualize itself as a group. We can unproblematically ascribe aggregate attitudes to a statistical collective, even though its members share nothing but some demographic attribute, such as the date of birth in the case of a particular generation.

The purpose of ascribing aggregate attitudes to a collective depends on the interests of whoever makes that ascription. The purpose could be *descriptive*: to give a maximally accurate or representative description of individual attitudes, as in an opinion poll or election. Or it could be *revelatory*: to extract as much information as possible from individual attitudes, as in a prediction market or in a scientific community, where we seek to "harvest" the wisdom of the crowd. In either case, whoever makes the ascription is the primary user of the ascribed aggregate attitudes.

2.5 *The relationship to individual attitudes*

Aggregate attitudes relate to individual attitudes in a very straightforward manner. The aggregate attitude on any proposition p is simply a suitable function of the corresponding individual attitudes on p or, at most, of individual choices or betting dispositions concerning p . In this sense, Quinton's comment that "[t]o ascribe mental predicates to a group is always an indirect way of ascribing such predicates to its members" is true of aggregate attitudes. Slightly more formally expressed:

Propositionwise supervenience: The collective (here aggregate) attitude on any proposition p supervenes on (is determined by) individual attitudes (or betting dispositions) on p .

There cannot be a difference in a given group's aggregate attitude on a proposition that is not directly traceable to a difference in individual attitudes (or betting dispositions) on the same proposition. It cannot happen, for example, that a group comes to believe p in aggregate due to changes in individual attitudes unrelated to p . Thus we may say that aggregate attitudes are straightforwardly "reducible" to underlying individual attitudes (on the notion of propositionwise supervenience, see also List and Pettit 2006 and 2011, ch. 3).

It should be clear that the supervenience relation holds only relative to a given aggregation rule. Once we have settled on the majority rule, for example, the aggregate attitude on p straightforwardly supervenes on individual attitudes on p . By contrast, it would be a mistake to think that there is a fact about what a group's aggregate attitude on p is, independently of the aggregation rule. The political scientist William Riker famously emphasized this dependence of aggregate attitudes

on the aggregation rule when he argued that there is no such thing as the “will of the people”, independently of the voting procedure used to generate it (Riker 1982).

Of course, the social-choice-theoretic literature contains not only aggregation rules respecting propositionwise supervenience (technically often called “propositionwise independence”), but also many rules violating it. For example, as is well known, if we vote only on some of the propositions – the “premises” – and derive the collective attitudes on others – the “conclusions” – by logical inference, then the collective attitude on each conclusion will depend not only on the individual attitudes on the conclusion but also on individual attitudes on the entire set of premises. The supervenience base for the resulting collective attitudes will then be considerably broader than propositionwise supervenience permits.

While such aggregation rules are well-motivated in many contexts, it is unclear whether the collective attitudes they generate are best interpreted as *aggregate* attitudes in the present sense or whether they are better viewed as *coherent corrections* of such attitudes, or as attitudes the group might rationally endorse if it were to act as an agent in its own right. If so, these non-propositionwise-independent aggregation rules are better seen as producers of potential *corporate* attitudes, as discussed below, rather than as producers of mere *aggregate* attitudes.

2.6 Rationality and group agency

As should be clear, the ascription of an aggregate attitude to a collective carries no ontological commitment to a group agent, over and above the individual agents of which the collective consists. So, since aggregate attitudes are not held by a single agent but are summaries of different agents’ attitudes, we should not be surprised if they lack the coherence we expect a rational agent’s attitudes to display. An opinion poll sample is not a unified agent, and hence it is no surprise if its attitudes turn out to be inconsistent.

Table 1 shows a well-known example of inconsistent majority beliefs, resulting from consistent individual beliefs. Generally, the majority rule fails to guarantee consistency and deductive closure in the aggregate attitudes it produces, even if the underlying individual attitudes are consistent and deductively closed (e.g., List and Pettit 2002; for a broader survey, see List 2012).

| | p | q | $p \text{ and } q$ |
|--------------|-------------|-------------|--------------------|
| Individual 1 | Believed | Believed | Believed |
| Individual 2 | Believed | Disbelieved | Disbelieved |
| Individual 3 | Disbelieved | Believed | Disbelieved |
| Majority | Believed | Believed | Disbelieved |

Table 1: Inconsistent majority attitudes

Other aggregation rules may perform better with respect to securing consistency and/or deductive closure, but *if* aggregate attitudes (in the summative sense defined here) are consistent and deductively closed, this is a purely contingent matter and not something that is rationally required.

Aggregate beliefs generated through prediction markets may be coherent as a byproduct of market incentives, but again this is a contingent point and not something required by rationality. The reason why market incentives may have this effect is that any violations of probabilistic coherence in the beliefs induced by market prices may correspond to opportunities for arbitrage. Such opportunities, in turn, should disappear when the market is in equilibrium.

Suppose, for example, the price for a bet on some proposition p is x US\$, where x is strictly between 0 and 1, and the price for a bet on *not* p is distinct from $1-x$ US\$. If the latter price is *less* than $1-x$ US\$, then a rational buyer can make a *sure* profit by buying both bets (on p and on *not* p) for a combined price of less than 1 US\$ and yet be *guaranteed* a payoff of 1 US\$ once the truth-value of p is known. This should not be possible in equilibrium. Similarly, if the price for a bet on *not* p is greater than $1-x$ US\$, then a rational vendor should be able to make a *sure* profit by the following transaction: short-selling both bets (on p and on *not* p) for a combined price of less than their current market price but above 1 US\$ and then repurchasing them back at a price of only 1 US\$ once the truth-value of p is known and the winning bet is valued at 1 US\$ while the losing bet is valued at 0 US\$. Again, making such a sure profit should not be possible in equilibrium. Market pressures can thus induce probabilistic coherence in market beliefs, though this is a mere byproduct of market incentives, not an intrinsic requirement on aggregate beliefs.

3. Common attitudes

3.1 Definition

It is time to move on to the second kind of collective attitude. A *common attitude* (of a collective) is an attitude held by all individual members of the collective, where their holding it is a matter of common awareness. More formally, this can be captured by the following sequence of clauses:

- (1) Every member of the collective holds the attitude.
 - (2) Every member believes that every other member holds the attitude.
 - (3) Every member believes that every other member believes that every other member holds the attitude.
- And so on.

Clause (1) expresses the fact that all members hold the attitude. Clauses (2), (3), (4), and so on express the fact that this is a matter of common awareness. (A subtly stronger definition omits all occurrences of the word “other” in clauses (2), (3), (4), and so on.) Common attitudes, especially in the form of common knowledge, have been famously studied by Lewis in his classic book on “Convention” (1969) and by Aumann in his paper “Agreeing to disagree” (1976) (for more recent overviews, see Vanderschraaf and Sillari 2014 and Perea 2012). Gilbert (1989) also recognizes a form of collective belief that is a matter of common knowledge, which my present

definition of common attitudes resembles. To define common knowledge, simply take the attitude in the definition above to be *knowledge that p* and replace every occurrence of the word “believes” with the word “knows”.

The notion of a common attitude also makes sense even if we think that common awareness should be defined differently, for example as a disposition rather than an infinite hierarchy of beliefs, or as a primitive (not further defined) notion, or in some other way. We would then have to replace clauses (2), (3), (4), and so on with our preferred alternative definition.

The technical details are less relevant for present purposes than the observation that, unlike aggregate attitudes, which can be the statistical construct of an outside observer, common attitudes are an inherently social phenomenon. They are held by the members of the collective *in common awareness of their holding them* and arguably play a role in many joint activities, most notably the solution of coordination problems.

3.2 *The roles played by common attitudes*

To see how common attitudes, especially common beliefs, can be central to the solution of many coordination problems, consider the following well-known example (Halpern and Moses 1990, quoted in Halpern 1995).

“Two divisions of an army are camped on two hilltops overlooking a common valley. In the valley awaits the enemy... [I]f both divisions attack the enemy simultaneously they will win the battle, whereas if only one division attacks it will be defeated... Neither general [in command] will decide to attack unless he is sure that the other will attack with him. The generals can only communicate by means of a messenger. Normally, it takes the messenger one hour to get from one encampment to the other. However, it is possible that he will get lost ... or, worse yet, be captured by the enemy... How long will it take them to coordinate on an attack?”

The problem is that sending the messenger from the first division to the second with an appropriate message, or vice versa, is not enough to give each division certainty that the other will attack. Even if the message is transmitted correctly and the second division learns about the intentions of the first, the first division cannot be sure that its message has actually been received, and hence its commanding general cannot know his counterpart’s beliefs. If the second division tries to address this problem by sending the messenger back with a confirmation, the first division will find out that its original message has been received, but now the second division will lack any knowledge about whether that confirmation has been successfully transmitted. It is easy to see that, no matter how often the messenger travels back and forth, it is impossible for the two generals to establish a common belief of their plans in this way. At every stage, only finitely many of the clauses (1), (2), (3), and so on in the definition of common belief are met. In the given scenario, a coordinated attack is simply not possible.

Of course, the example is somewhat stylized, but structurally similar coordination problems, in which each member of a collective is willing to participate in a joint

activity if and only if other members participate as well, arise in many different settings (for an overview, see Chwe 2001). Revolutions and political campaigns are obvious examples. These activities cannot get off the ground without the right coordination. As in the coordinated-attack example, unilateral action would often be too costly for participants here, so that they may start the activity only once the relevant individuals' intentions to participate are commonly known. Generally, common attitudes may be central in the switch from one equilibrium to another in a coordination game – say the switch from the status quo to a superior alternative – especially when the costs of coordination failure are high.

Common attitudes also play a crucial role in sustaining and stabilizing many existing social practices. A key prerequisite of the power of many positions in society – such as the office of head of state or the office of judge – is that it is commonly known among the relevant parties who holds that position and what powers and responsibilities are associated with it. A president or judge who is not commonly recognized as such lacks the power associated with his or her role. Similarly, a banknote, or more generally a currency, owes its value to the common beliefs backing it up. Currencies that are no longer commonly believed to be valuable typically lose their value. These examples should illustrate that common attitudes are a ubiquitous glue of the social world.

As Chwe (2001) and others (e.g., Ober 2008) have observed, the point of many rituals is precisely the generation of common beliefs – and not merely, as sometimes thought, the expression of certain values, identities, or emotions. A public inauguration of an office-holder generates in all members of the audience not only (1) the belief that the person in question now holds the office, but also (2) the belief that everyone else believes that this is the case, (3) the belief that everyone else believes that everyone else believes that this is the case, and so on. As Chwe notes, it is no accident that, in many ceremonies, participants stand in a circle and publicly observe each other when a significant declaration is made. Examples range from weddings and inauguration ceremonies to the signing of an international treaty. Here, the participants acquire not only a first-order attitude, such as a belief about the content of the ceremony, but also a sequence of higher-order beliefs, corresponding to common awareness of their sharing the belief in question.

3.3 The relationship to individual attitudes

Although common attitudes, unlike aggregate attitudes, show up directly in the beliefs of individuals about others' attitudes and can play significant roles in social coordination, their relationship to individual attitudes is still relatively straightforward. A common attitude on some proposition p supervenes on more than just the individual attitudes on p , but it still supervenes on attitudes *related to* p , such as beliefs about other individuals' attitudes on p . Therefore the supervenience base of common attitudes is still relatively “narrow”:

Enriched propositionwise supervenience: The collective (here common) attitude on any proposition p supervenes on individual attitudes on p and individual beliefs about other individuals' attitudes related to p , as detailed in clauses (1), (2), (3), and so on.

There can never be a difference in a group's common attitude on a proposition that is not traceable either to a difference in individual attitudes on that proposition or to a difference in individual beliefs about other individuals' attitudes related to the proposition. Common attitudes are thus still relatively straightforwardly "reducible" to underlying individual attitudes. Indeed, the definition of a common attitude I have given defines it solely in terms of a particular configuration of individual attitudes, namely the configuration specified by clauses (1), (2), (3), and so on.

3.4 Non-reductionistic accounts of common attitudes

In contrast to the "reductionistic" account of common attitudes that I have given, one could also give a rival "non-reductionistic" account. This could take one of at least two forms. First, one could take common attitudes to be marked by a distinct "mode" with which they are held; they could be "we"-attitudes, rather than "I"-attitudes. Second, one could take common attitudes to be held by a collective subject, which is brought into existence by certain joint activities or commitments of multiple individuals. Variants of these accounts can be found in the literature on the intentions underpinning joint actions (for a survey, see Schweikard and Schmid 2013; for further discussion, see Tuomela 2007).

Searle's account of the intentions behind joint actions is a variant of the first non-reductionistic account. He suggests that joint actions are based on we-intentions. These are intentions held by individuals, but the "mode" with which they are held differs from the mode with which the individuals' ordinary I-intentions are held. When we engage in a joint action with others, on this account, we form a special kind of we-intention, as distinct from our ordinary I-intentions. The capacity to form such we-intentions, Searle suggests, is central to our ability to engage in complex social interactions. (The idea of we-intentions goes back further to Sellars 1968, as discussed by Schweikard and Schmid 2013.)

Gilbert's account of the intentions underlying joint actions is a variant of the second non-reductionistic account. She suggests that joint actions involve "plural subjects". Specifically, the individuals engaged in a joint action bring into existence a plural subject to which intentions can then be ascribed. On this picture, any joint action is performed by a collective that constitutes a plural subject, which is the bearer of the relevant intentions.

Whatever the merits of these accounts (and I am oversimplifying them here, omitting important details and nuances), they correspond to very different approaches to explaining coordinated activities from the approach I have adopted. Although the *roles* that non-reductionistic attitudes are supposed to play in relation to joint action are similar to the roles that I have taken common attitudes of the reductionistic kind to play, they play these roles in very different ways. Searle's and Gilbert's non-reductionistic attitudes are not ordinary attitudes of individuals held as a matter of common awareness, which function exactly like other individual attitudes, but they are something else: they are either distinct we-attitudes, held by individuals in a special, collectively oriented psychological mode, or they are attitudes held by a novel, plural subject, constituted by several participating individuals.

How do these two kinds of non-reductionistic attitudes fit into my taxonomy of different kinds of collective attitudes? As far as the “we-mode” account is concerned, one might in principle amend that taxonomy by defining a notion of “we-attitudes” distinct from both aggregate attitudes and corporate attitudes, whose role is still broadly analogous to that of common attitudes as I have defined them here. However, unlike common beliefs and commonly known preferences, such we-attitudes are less widely recognized in the social sciences, and it is an open question whether we need them in order to explain any social phenomena. That is why I have not (yet) included them in my taxonomy. (Plausibly, even Searle’s own theory of social construction – especially his account of how social facts are created via the collective acceptance of certain statuses of objects or persons – might be modified such that the role played by we-intentions is played by common intentions of a more reductionistic kind.)

As far as the plural-subject account is concerned, attitudes ascribed to plural subjects seem more akin to what I call corporate attitudes in this paper: the kind of collective attitudes discussed in Section 4. It is not clear, however, that we need to invoke plural subjects to fill the functional role played by common attitudes in social coordination, given that there are some good social-scientific theories of how common attitudes of the present reductionistic kind do this job (for examples of such social-scientific theories, see Chwe 2001 and Perea 2012). Invoking a plural subject each time a group of individuals performs a joint action seems to give rise to an unnecessarily rich ontology of subjects.

A third and structurally distinct non-reductionistic account, which I set aside in light of space limitations, is the joint-attention account discussed by Campbell (2005) and others. On this account, two or more individuals’ jointly attending to something is a psychologically primitive phenomenon whose role in relation to joint action is somewhat similar to that of common attitudes discussed here. Joint attention – unlike common attitudes, we-attitudes, or the attitudes of plural subjects – is a perceptual phenomenon. (For an overview, see Eilan et al. 2005.)

3.5 Rationality and group agency

Like aggregate attitudes, common attitudes, on my account, can occur in collectives that are not group agents. The only intentional agents needed for the existence of common attitudes are the individuals referred to in clauses (1), (2), (3), and so on. Nonetheless, because of the unanimitarian structure of common attitudes, some basic rationality conditions may be satisfied by common attitudes.

Suppose the individual attitudes in clause (1) satisfy conditions such as consistency. Since common attitudes are by definition unanimously held within the relevant collective, the consistency of the individual attitudes will carry over to common attitudes: any attitudes that lie within the intersection of several individuals’ consistent attitudes will still be consistent. So, at least in a collective of formally rational individuals (individuals with consistent attitudes), the common attitudes, if any, will be formally rational too. This sets common attitudes apart from aggregate attitudes, where consistency is, at best, a contingent feature.

3.6 *Falsely attributed common attitudes*

Before moving on to the third kind of collective attitude, it is worth noting a striking social phenomenon in the neighbourhood of common attitudes. There can be attitude structures that mimic common attitudes in their effects on social coordination, even though they rest on false attributions. Recall that a common attitude within a collective requires that:

- (1) Every member of the collective holds the attitude.
- (2) Every member believes that every other member holds the attitude.
- (3) Every member believes that every other member believes that every other member holds the attitude.

And so on.

Now imagine that clauses (2), (3), (4), and so on are met, while clause (1) is not. Depending on the details of the situation, the effects on social coordination may be the same as in the case of a real common attitude, where clause (1) is met, but the coordinated actions will be sustained by false attitude attributions. The presence of falsely attributed common attitudes may be one of the reasons why certain bad social behaviours – such as the wide cooperation with a unanimously hated political regime or the compliance with harmful social norms – can persist despite a private lack of support.

The present phenomenon is related to what social psychologists call “pluralistic ignorance”: “a psychological state characterized by the belief that one’s private attitudes and judgments are different from those of others, even though one’s public behavior is identical” (Prentice and Miller 1993, p. 244; Miller and McFarland 1987; see also Chwe 2001). On university campuses, for instance, students believe that others are more comfortable with high levels of alcohol consumption than they themselves are (e.g., Prentice and Miller 1993). Excessive social drinking may persist even though many of the participants privately dislike this practice. Similarly, a survey in the United States suggested that “in 1968 most white American adults grossly exaggerated the support among other whites for racial segregation” (O’Gorman 1975, p. 313), thereby falsely attributing racist attitudes to one another.

If my earlier discussion of the role of common attitudes in social coordination is correct, we should expect that, when a falsely attributed common attitude unravels, this will facilitate a switch from a bad social equilibrium to a better alternative. Protests against repressive political regimes may become easier once people cease to attribute to each other the false common belief that the regime has wide support. A few individuals’ publicly observable admission that the emperor has no clothes may sometimes be enough to prompt a collapse in the hierarchy of beliefs described by clauses (2), (3), (4), and so on, when clause (1) is in fact not met. Falsely attributed common attitudes should therefore be less robust to certain informational shocks than genuine common attitudes, other things being equal. It is no surprise that repressive political regimes often place restrictions on the use of public spaces or public communication that may facilitate the generation of common attitudes not controlled by the rulers.

In a widely cited sociological study, Mackie (1996) offers an analysis of two harmful social practices as equilibria in coordination games: female footbinding, which was common in China for about 1000 years, and female genital mutilation, which still occurs in some parts of the world today. What originally led to those practices and to what extent falsely attributed common attitudes sustained them are difficult questions, but Mackie makes a claim that is highly relevant to the present discussion. He argues that, in the successful Chinese campaign to end footbinding, “[t]he pivotal innovation was to form associations of parents who pledged not to footbind their daughters nor let their sons marry footbound women” (p. 999). Pledges were made publicly, generating common beliefs among the participants that they had renounced the practice, thereby facilitating an equilibrium switch. Mackie suggests that public pledges may similarly help end the practice of female genital mutilation today. In a subsequent paper, he gives evidence from Senegal suggesting that a number of villages had indeed used that method to end the practice (Mackie 2000).

The issues are obviously complex, but it should be clear that common attitudes, both genuine ones and even falsely attributed ones, can play central roles in equilibrium selection problems within collectives.

4. Corporate attitudes

4.1 Definition

The third kind of collective attitude is the least “reducible” kind. A *corporate attitude* (of a collective) is an attitude held by the collective as an intentional agent. To say that a collective holds a corporate belief or desire in some proposition p is to say that the collective is an agent in its own right, which holds that belief or desire. Thus not all collectives are capable of holding corporate attitudes; only those that qualify as group agents are.

For example, the United States Supreme Court and other collegial courts arguably fall into this category, as do commercial corporations, NGOs, and other purposive organizations such as cohesive political parties, universities, and especially states. In consequence, they are capable of holding corporate attitudes. By contrast, a random collection of individuals, such as the people who happen to be on Times Square at a particular time, does not. Such a collection cannot hold corporate attitudes.

4.2 What is an intentional agent?

To define a group agent, it is best to begin with a general definition of an intentional agent, not restricted to the case of groups (List and Pettit 2011, ch. 1). In the simplest terms, an intentional agent is a system, located in some environment, which has

- *beliefs* about what its environment is like;
- *desires* or *goals* about what it would like to achieve in its environment; and
- a *capacity to act* in its environment, so as to pursue its desires or goals in line with its beliefs.

Typical human beings easily fit this definition. But so do cats, dogs, and chimpanzees, although they are agents of a less complex sort. The contents of their attitudes and

their agential capacities are simpler than in the human case, but they are nonetheless systems with beliefs about the environment, desires or goals they seek to pursue, and a capacity to act in line with their beliefs and desires.

Unless we endorse some form of human or biological “essentialism” about agency, we have no reason to think that humans or biological animals are the only creatures capable of satisfying the present definition of agency. The definition is deliberately thin and general. For example, it does not specify how complex the beliefs and desires must be for a system to qualify as an agent. The fact that there can be some trivial cases of agents such as thermostats (which might be said to have beliefs and desires about the temperature and to act by regulating the heating) need not worry us here. Also, the definition is not loaded with any metaphysical requirements about consciousness, first-person experiences, or the like. Finally, the definition is entirely positive, not normative. It is completely silent on the relationship between intentional agency in a thin descriptive sense and the normative status of any system.

Given all this, there is nothing, in principle, that would prevent a sufficiently sophisticated robot or other non-biological system from qualifying as an intentional agent in the present sense. Similarly, a suitably organized collective can qualify as an agent too. A *group agent* is a collection of individuals that is organized in such a way as to have beliefs, desires or goals, and a capacity to act, through the contributions of its members, so as to pursue its desires or goals in accordance with its beliefs (List and Pettit 2006 and 2011, drawing on Pettit 2001, ch. 5, and 2003a; for other accounts of group agency, see, e.g., French 1984 and Tollefsen 2002a,b; on the relationship between joint action and group agency, see also Pettit and Schweikard 2006).

The beliefs and desires of a group agent – i.e., its corporate attitudes – are held, not by the individuals, but by the group as an agential system in its entirety. This is analogous to the way in which an individual human’s beliefs and desires are held, not by any single part of his or her brain and body, such as a particular set of neurons, but by the individual as a whole, in his or her capacity as an agent.

At first, one might worry that the present definition of corporate attitudes is circular. Corporate attitudes are the attitudes of a group agent, and a group agent, in turn, is a collective that holds such attitudes. But there is no circularity here. If we understand intentional attitudes such as beliefs and desires in functionalist terms – defining them in terms of the functional role they play in an agent, not in terms of their metaphysical nature (see, e.g., Jackson and Pettit 1988) – then an agent’s beliefs are simply those states of the agent whose functional role is to represent certain features of the environment. Its desires are those states whose functional role is to depict a target specification of the environment, perhaps a specification of the agent in relation to its environment (e.g., the agent’s target of acquiring some food). And the agent’s capacity to act is the capacity to intervene in the world, for instance through movement or speech, in response to the agent’s belief states and desire states. The beliefs and desires of a group agent are thus whichever states of the organized collective play the relevant functional roles. For example, an organization’s beliefs and desires related to the pursuit of a particular project are simply the states of the organization – configurations of individual members, processes, and so on – that play the functional role of guiding the organization’s actions in pursuit of the project in

question. Typically, the beliefs and desires of an organization will be generated through certain decision-making procedures, such as relevant committees or boards.

Whether or not a given collective qualifies as a group agent depends on how it is organized: its organizational structure, decision-making procedures, and so on. Only sufficiently structured collectives are candidates for group agency, including some of the examples mentioned above, from commercial corporations to collegial courts. Random collectives lack the required organizational structure and hence cannot generate corporate beliefs and desires.

4.3 The roles played by corporate attitudes

As evident from the definition of corporate attitudes, the roles played by corporate beliefs and desires in a group agent are exactly the same as the roles played by ordinary beliefs and desires in any agent. They are simply the attitudes governing the agent's actions. A group agent – if formally rational – acts in accordance with its corporate beliefs and desires, not in accordance with those of any of its individual members. Thus corporate attitudes come with an inbuilt social role: they are the intentional attitudes of the collective as an agent.

The ways in which corporate attitudes are generated within a group's organizational structure and lead to the group's actions, through the contributions of its members, may differ significantly from group to group. The US Supreme Court, Apple, and the United Kingdom may each be group agents, and yet they are organized in very different ways. This mirrors the point that differently engineered robots may be based on different hardware and software encoding their belief-and-desire states and governing their interaction with the environment.

4.4 The relationship to individual attitudes

Unlike aggregate and common attitudes, corporate attitudes are not straightforwardly reducible to individual attitudes. Conceptually, there is no reason to think that, for a particular state of an organized collective to function as an action-guiding belief-and-desire state, it must be the case that the individual members share a matching belief-and-desire state (List and Pettit 2011). Indeed, different group members may contribute in different ways to the formation of the group's beliefs and desires and to the pursuit of its goals, where each individual shares at most a commitment to some "sub-plan" (on planning agency, see also Bratman 2014).

In fact, it can be shown that a group agent's attitudes on each proposition in question could not generally be a function of individual attitudes on the same proposition. To illustrate, recall that if the group's attitudes were generated by majority rule, they would not generally be consistent, as shown in Table 1 above. Thus the majority attitudes could not generally serve as a basis for rational agency at the collective level. (As discussed below, a modicum of rationality is a necessary condition for group agency.) To achieve consistent corporate attitudes, consistency-restoring deviations from the majority attitudes may be necessary, for instance by overruling the majority attitudes on some propositions in order to respect the logical implications of the majority attitudes on others. In the example of Table 1, we might generate consistent corporate attitudes by accepting the majority attitudes on propositions p and q and

deriving the corporate attitude on their conjunction by logical implication. The resulting attitude on the conjunction p and q would then no longer be the majority attitude on that proposition.

This point generalizes. Except in special cases, no aggregation rule can robustly secure consistent and complete corporate attitudes on a set of interconnected propositions *and* also make the collective attitude on every proposition a function of the individual attitudes on the same proposition (List and Pettit 2006, 2011). More formally, propositionwise supervenience, as introduced above, is not generally consistent with *robust group rationality*, the requirement of consistent and complete corporate attitudes across variations in underlying individual attitudes. This supports:

Holistic supervenience: The collective (here corporate) attitude on any proposition p supervenes on the individual attitudes across a web of interconnected propositions and/or other non-attitudinal contributions by the individuals.

The relationship between (i) corporate attitudes and (ii) individual attitudes or non-attitudinal contributions is similar to the relationship between (i) mental states and (ii) their neural realizers in the brain, according to *non-reductive physicalism*. The relationship is one of *supervenience without reducibility*. In the social-individual case, just as in the mind-body case, (i) supervenes on (ii), but (i) is not reducible to (ii). For this reason, the present view about the status of corporate attitudes may be described as a form of *non-reductive individualism* (Sawyer 2002, 2003), *non-redundant group-agency realism* (List and Pettit 2011), or *type holism* together with *supervenience individualism* (List and Spiekermann 2013).

4.5 Rationality and group agency

As we have seen, corporate attitudes can occur only in collectives that qualify as agents. So, the ascription of a corporate attitude to a collective, unlike the ascription of an aggregate attitude or a common attitude, carries an ontological commitment to a group agent.

Moreover, it is an essential requirement on corporate attitudes that they satisfy certain requirements of rationality (though these need not be unrealistically demanding). To begin with, a group agent, like any intentional agent, is subject to certain rationality requirements. However, these are essential not just from the practical perspective of good functioning, as with any agent. They are also a key prerequisite for justifying the ascription of group agency in the first place (for a related discussion, see Pettit 2003b). A collective qualifies as a group agent only if its collective pattern of behaviour can be explained, or “rationalized”, as being belief-desire-driven in a sufficiently systematic way. A collective whose behaviour is not “rationalizable” in this way is normally best interpreted, not as an irrational group agent, but as a non-agential collective, where there is no reason to expect any rational attitudes at all.

It is generally accepted that, unless a system (whether biological, physical, or social) exhibits at least a modicum of rationality, we are not warranted in ascribing intentional agency to it, unless there are mitigating circumstances (see, e.g., Dennett 1987 on the conditions under which we may take an “intentional stance” towards a

system). But in the case of individual human beings, there is an independent presumption of intentional agency, based on what we know about humans in general. We tend to qualify or abandon the hypothesis that a particular human person is an intentional agent only in the face of persistent, globally irrational behaviour, for example, due to severe psychological or neurological disorders. By contrast, in the case of groups, the burden of proof is on those who defend the hypothesis that a particular group is an intentional agent, not on those who think that the group lacks agency and hence cannot be expected to hold rational corporate attitudes. (On a Dennett-style interpretation of groups as bearers of intentional attitudes, see also Tollefsen 2002b.)

As a result, there is no justification for viewing a group as an agent when its behaviour is not sufficiently compatible with the hypothesis that the group acts in a systematic belief-desire-driven way. When we look at the chaotic behaviour in a stampede, for example, the best explanation is not one that invokes group agency, but one that interprets the stampede as a catastrophic byproduct of individual interactions. In the same way, we would not ascribe intentional agency to the snow in an avalanche or to a volcano that is erupting; these are simply not agential phenomena.

This is not to say that the rationality requirements on group agents should be more demanding than those on individuals. We know from many studies in psychology and behavioural economics that most individual human beings display certain deviations from the classical requirements of rationality. These range from susceptibility to framing and nudging, cyclical choice behaviour, and various forms of dynamic inconsistency to fallacies of reasoning, such as conjunction fallacies, base rate fallacies, and so on. Crucially, however, the typical deviations are local ones; they do not undermine the folk-psychological picture of humans as intentional agents, with a belief-desire psychology. Similarly, sufficiently local deviations from the requirements of rationality do not undermine the ascription of intentional agency to an organized collective. Global irrationality, by contrast, does. (On the rationality requirements on group agents, see also List and Pettit 2012, specifically the response to Gaus's criticism.)

The present paper is not the place to defend the possibility of group agency or to comment on the organizational designs that might support it. For a detailed account, see List and Pettit (2011). Here I simply wish to note that the conditions for the ascription of corporate attitudes to a group are closely tied to the conditions that warrant the ascription of intentional agency to it, which include the satisfaction of certain rationality requirements. Corporate attitudes are fundamentally different in this respect from both aggregate and common attitudes, whose ascription does not presuppose any requirements of rationality.

5. Concluding remarks

The three kinds of collective attitudes I have discussed – aggregate, common, and corporate ones – are genuinely distinct and, in fact, *almost* logically independent.

Lesson 1: An aggregate attitude need not involve either a common attitude or a corporate attitude.

As we have seen, aggregate attitudes can be ascribed to non-agential collectives and even to collectives that do not view themselves as groups. Consequently, none of the richer social phenomena associated with common attitudes or corporate attitudes need to be present for the ascription of aggregate attitudes to make sense.

Lesson 2: A common attitude need not involve a corporate attitude, and, *in the related case of a falsely attributed common attitude*, it need not even involve an aggregate attitude. (The italicized qualification is the reason for my claim that the three kinds of collective attitudes are only *almost* independent.)

Since group agency is not a requirement for the ascription of common attitudes, a collective can have common attitudes in the absence of any corporate attitudes. And while genuine common attitudes are always unanimously held – and will therefore be aligned with some underlying aggregate attitudes – falsely attributed common attitudes can come apart from the relevant aggregate attitudes. It is possible for all members of some collective to believe that the emperor has no clothes, and yet for the individuals to attribute to one another a false common belief that the emperor has beautiful clothes. Here the group’s aggregate attitude would be distinct from its falsely attributed common attitude.

Lesson 3: A corporate attitude need not involve either an aggregate attitude or a common attitude.

Due to the failure of propositionwise supervenience, a group’s corporate attitude on a proposition need not be a function of its members’ individual attitudes on the same proposition, and hence it need not coincide with whatever the aggregate attitude on that proposition may be. It is even possible for a group agent to have corporate attitudes on propositions that many, even most, group members are unaware of. A state, for example through its intelligence services, may have action-guiding corporate attitudes on a variety of propositions that have never crossed the minds of most citizens. Similar points are true of other complex organizations. *A fortiori*, the existence of a corporate attitude on a proposition need not presuppose a common attitude on that proposition. Even if it is a matter of common awareness among the members of a group *that this group is an agent, with a particular organizational structure*, the group’s corporate attitudes need not be a matter of common awareness.

I conclude by summarizing the key features of the three kinds of collective attitudes in Table 2.

| | Aggregate attitudes | Common attitudes | Corporate attitudes |
|---|--|--|--|
| Functional role played in a collective | No direct functional role, at most an indirect one | Can play an important role in social coordination | Action-guiding for the group agent |
| Supervenience base | Narrow: individual attitudes or betting dispositions on each proposition in question | Slightly broader: individual attitudes on each proposition in question, plus beliefs about others' attitudes | Much broader: webs of attitudes on interconnected propositions and non-attitudinal contributions |
| Reducible to individual attitudes | Straightforwardly reducible | Straightforwardly reducible | Not straightforwardly reducible |
| Rationality requirements | Not presupposed and at most contingently satisfied | Not presupposed, but satisfied by virtue of the unanimitarian structure | Presupposed and essential for the ascription of group agency |
| Group agent involved | No | No | Yes |

Table 2: Key features of the three kinds of collective attitudes

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References

- Arrow, K. (1951/1963). *Social Choice and Individual Values*. New York: Wiley.
- Aumann, R. J. (1976). Agreeing to Disagree. *The Annals of Statistics*, 4(6), 1236-1239.

- Barberà, S., Gul, F., & Stacchetti, E. (1993). Generalized Median Voter Schemes and Committees. *Journal of Economic Theory*, 61(2), 262-289.
- Bratman, M. E. (1999). *Faces of Intention: Selected Essays on Intention and Agency*. Cambridge: Cambridge University Press.
- Bratman, M. E. (2014). *Shared Agency: A Planning Theory of Acting Together*. Oxford: Oxford University Press.
- Campbell, J. (2005). Joint Attention and Common Knowledge. In N. Eilan, C. Hoerl, T. McCormack, & J. Roessler (Eds.), *Joint Attention: Communication and Other Minds: Issues in Philosophy and Psychology* (pp. 287-297). Oxford: Oxford University Press.
- Chwe, M. S.-Y. (2001). *Rational Ritual: Culture, Coordination, and Common Knowledge*. Princeton: Princeton University Press.
- Dennett, D. (1987). *The Intentional Stance*. Cambridge/MA: MIT Press.
- Dietrich, F., & List, C. (2007). Strategy-proof judgment aggregation. *Economics and Philosophy*, 23(3), 269-300.
- Dietrich, F., & List, C. (2010). The aggregation of propositional attitudes: towards a general theory. *Oxford Studies in Epistemology*, 3, 215-234.
- French, P. A. (1984). *Collective and Corporate Responsibility*. New York: Columbia University Press.
- Gibbard, A. (1973). Manipulation of voting schemes: a general result. *Econometrica*, 41, 587-601.
- Gilbert, M. (1989). *On Social Facts*. New York: Routledge.
- Goldman, A. (2010). Why Social Epistemology Is Real Epistemology. In A. Haddock, A. Millar, & D. Pritchard (Eds.), *Social Epistemology* (pp. 1-28). Oxford: Oxford University Press.
- Halpern, J. Y. (1995). Reasoning about Knowledge: A Survey. In D. Gabbay, C. J. Hogger, & J. A. Robinson (Eds.), *Handbook of Logic in Artificial Intelligence and Logic Programming*, Vol. 4 (pp. 1-34). Oxford: Oxford University Press.
- Halpern, J. Y., & Moses, Y. (1990). Knowledge and common knowledge in a distributed environment. *Journal of the ACM*, 37(3), 549-587.
- Hanson, R. (2013). Shall We Vote on Values, But Bet on Beliefs? *Journal of Political Philosophy*, 21(2), 151-178.
- Jackson, F., & Pettit, P. (1988). Functionalism and Broad Content. *Mind*, 97(387), 381-400.
- Lewis, D. (1969). *Convention*. Cambridge/MA: Harvard University Press.
- List, C. (2012). The theory of judgment aggregation: An introductory review. *Synthese*, 187(1), 179-207.
- List, C. (2013). Social Choice Theory. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*, Winter 2013 Edition, <<http://plato.stanford.edu/archives/win2013/entries/social-choice>>.
- List, C., & Pettit, P. (2002). Aggregating Sets of Judgments: An Impossibility Result. *Economics and Philosophy*, 18(1), 89-110.
- List, C., & Pettit, P. (2006). Group Agency and Supervenience. *Southern Journal of Philosophy*, 44(S1), 85-105.
- List, C., & Pettit, P. (2011). *Group Agency: The Possibility, Design, and Status of Corporate Agents*. Oxford: Oxford University Press.
- List, C., & Pettit, P. (2012). Episteme Symposium on Group Agency: Replies to Gaus, Cariani, Sylvan, and Briggs. *Episteme*, 9(3), 293-309.

- List, C., & Spiekermann, K. (2013). Methodological Individualism and Holism in Political Science: A Reconciliation. *American Political Science Review*, 107(4), 629-643.
- Mackie, G. (1996). Ending Footbinding and Infibulation: A Convention Account. *American Sociological Review*, 61(6), 999-1017.
- Mackie, G. (2000). Female Genital Cutting: The Beginning of the End. In B. Shell-Duncan & Y. Hernlund (Eds.), *Female Circumcision: Multidisciplinary Perspectives* (pp. 245-282). Boulder/CO: Lynne Rienner Publishers.
- Miller, D. T., & McFarland, C. (1987). Pluralistic ignorance: When similarity is interpreted as dissimilarity. *Journal of Personality and Social Psychology*, 53(2), 298-305.
- Moulin, H. (1980). On strategy-proofness and single peakedness. *Public Choice*, 35(4), 437-455.
- Ober, J. (2008). *Democratic Knowledge: Innovation and Learning in Classical Athens*. Princeton: Princeton University Press.
- O’Gorman, H. J. (1975). Pluralistic ignorance and white estimates of white support for racial segregation. *Public Opinion Quarterly*, 39(3), 313-330.
- Perea, A. (2012). *Epistemic Game Theory: Reasoning and Choice*. Cambridge: Cambridge University Press.
- Pettit, P. (2001). *A Theory of Freedom: From the Psychology to the Politics of Agency*. Cambridge and New York: Polity and Oxford University Press.
- Pettit, P. (2003a). Groups with Minds of their Own. In F. Schmitt (Ed.), *Socializing Metaphysics* (pp. 167-193). New York: Rowan and Littlefield.
- Pettit, P. (2003b). Akrasia, Collective and Individual. In S. Stroud & C. Tappolet (Eds.), *Weakness of Will and Practical Irrationality* (pp. 68-96). Oxford: Oxford University Press.
- Pettit, P., & Schweikard, D. (2006). Joint Actions and Group Agents. *Philosophy of the Social Sciences*, 36(1), 18-39.
- Prentice, D. A., & Miller, D. T. (1993). Pluralistic Ignorance and Alcohol Use on Campus: Some Consequences of Misperceiving the Social Norm. *Journal of Personality and Social Psychology*, 64(2), 243-256.
- Quinton, A. (1975). The Presidential Address: Social Objects. *Proceedings of the Aristotelian Society*, 76, 1-27+viii.
- Riker, W. (1982). *Liberalism against Populism*. San Francisco: W. H. Freeman.
- Satterthwaite, M. (1975). Strategyproofness and Arrow’s conditions: existence and correspondences for voting procedures and social welfare functions. *Journal of Economic Theory*, 10, 187-217.
- Sawyer, R. K. (2002). Nonreductive Individualism. Part I – Supervenience and Wild Disjunction. *Philosophy of the Social Sciences*, 32(4), 537-559.
- Sawyer, R. K. (2003). Nonreductive Individualism. Part II – Social Causation. *Philosophy of the Social Sciences*, 33(2), 203-224.
- Schweikard, D. P., & Schmid, H. B. (2013). Collective Intentionality. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*, Summer 2013 Edition, <<http://plato.stanford.edu/archives/sum2013/entries/collective-intentionality>>.
- Searle, J. R. (1995). *The Construction of Social Reality*. London: Penguin.
- Sellars, W. (1968). *Science and Metaphysics: Variations on Kantian Themes*. London: Routledge.
- Sunstein, C. R. (2006). Deliberating Groups vs. Prediction Markets (or Hayek’s Challenge to Habermas). *Episteme*, 3(3), 192-213.

- Tollefsen, D. P. (2002a). Collective Intentionality and the Social Sciences. *Philosophy of the Social Sciences*, 32(1), 25-50.
- Tollefsen, D. P. (2002b). Organizations as True Believers. *Journal of Social Philosophy*, 33(3), 395-410.
- Tuomela, R. (2007). *The Philosophy of Sociality: The Shared Point of View*. New York: Oxford University Press.
- Vanderschraaf, P., & Sillari, G. (2014). Common Knowledge. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*, Spring 2014 Edition, <<http://plato.stanford.edu/archives/spr2014/entries/common-knowledge/>>.