Disagreeing to Agree Collectively

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Abstract

British and American speakers exhibit different verb number agreement patterns when sentence subjects have collective head nouns. From linguistic and psycholinguistic accounts of how agreement is implemented, three alternative hypotheses can be derived to explain these differences. The hypotheses involve variations in the representation of notional number, disparities in how notional and grammatical number are used, and inequalities in the grammatical number specifications of collective nouns. We carried out a series of corpus analyses, production experiments, and norming studies to test these hypotheses. The results converge to suggest that British and American speakers are equally sensitive to variations in notional number and implement subject-verb agreement in much the same way, but are likely to differ in the lexical specifications of number for collectives. The findings support a psycholinguistic theory that explains verb and pronoun agreement within a parallel architecture of lexical and syntactic formulation.*

A familiar but still striking difference between British and American English is the realization of verb agreement with collective-headed subject noun phrases. The difference is legislated not only by the grammars of speakers, but by prescriptions from language watchdogs in the British and American communities. The BBC News Styleguide notes that 'It is the policy of BBC Radio News that collective nouns should be plural, as in *The Government have decided*' (Allen, 2004, p. 31). William Safire says that in American English, 'collectives collect, and the bunched-up bunch is construed as singular' (1992). Usage reveals contrasting patterns of agreement with the same corporate and collective nouns, as in (1)-(9), taken verbatim from assorted spoken and written sources.

(1) *staff*

American: Staff *does* need to report, but students do not need to report

British: There *are* no office staff today

(2) *family*

American: I think my family *was* pretty open-minded about different kinds of people

British: I don't think the Royal Family *are* really known for their intelligence

(3) *government*

American: The government [of the Dominican Republic] *has* reluctantly made some improvements

British: I understand the pressure that the Israeli government *are* under

(4) *crew*

American: The crew of a Russian military cargo jet had stolen some cows in Siberia and *was* flying them home

British: Professional yacht crew *are* also required

(5) *air traffic control*

American: Air traffic control*'s* got us holding

British: Air traffic control *have* now given us permission to land

(6) *community*

American: ..ensuring that our community [Santa Monica] *does* not respond to our financial crisis

British: The British community *do* not….

(7) *party*

American: The party of a man on trial *wins* the most seats in Parliament

British: It's clear that this is the reaction of an embattled Tory party that *believe it's* going to lose

(8) *press*

American: The press *is* critical to Sundance

British*:* There *are* press camped outside my parents' house

(8) *management*

American: Management *is* not responsible for the street team

British: The management *are* not responsible

(9) government agencies, corporations, and sports teams

American: The object is what NASA *describes* as 'a heavily modified' 1953 Ford pickup truck

British: How *áre* NASA going to save the earth?

American: By spring the Pentagon *plans* to let most of them come home

British: The Pentagon *are* being fairly cagey

American: Water District *Maintains* That Target of Clean Water Act is Industrial Polluters

British: The South Florida Water Management District *have* been taken to court

American: Francisco Partners [a law firm] *is* pleased to announce the following appointments…

British: Diamond only *do* car insurance for women

American: But ABC, along with Fox, *has* also paid millions of dollars for interviews or specials with Mr. Jackson

British: BBC 1 *are* showing a documentary on what's in store on the fast-track graduate medical course

American: Mr. Murdoch's father, Rupert, is chairman of the News Corporation, which *owns* 35 percent of BSkyB.
British: 'Owned by News International, who also owns *[sic]* Today newspaper.' ([sic] in the original, from the *Guardian*, quoting a pronouncement by the editor of a Murdoch tabloid)

American: The Benchmade Knife company *has* manufactured quality knives since 1988
British: Corrie of Petersfield *have* manufactured this Easi-Kneeler Stool

American: Our bakery *takes* full advantage of…
British: Our bakery *continue* to deliver fresh hand made bread

American: The Heat *beats* the Jazz
British: Manchester United *have* completed the signing of a Chinese player

Many of the British examples strike American speakers as completely unacceptable, even 'awful,' to quote one young informant. In a test performed on students from the United States and Britain, samples of British-style collective agreement were corrected by Americans 95% of the time, compared to 29% by British students (Johansson, 1979).

Traditional views of the dialect contrast in both linguistics and psycholinguistics emphasize differences in reliance on number meaning. Quirk, Greenbaum, Leech, and Svartvik (1985, p. 757) state flatly that 'In British English…collective nouns such as government are often treated as notionally plural.' Vigliocco and Franck (2001, p. 370) echo this, writing that 'British English, in contrast with American English, sometimes allows use of conceptual information rather than syntactic information to compute number agreement' with collective nouns. The explanation given by Quirk et al. is that 'the choice between singular or plural verbs depends in British English on whether the group is being considered as a single undivided body, or as a collection of individuals' (p. 758). The implication is that in American English, speakers are less likely to bring such considerations to bear. More formally, Sauerland and Elbourne (2002) proposed that British collective agreement makes use of a Mereology feature that is absent from American English. In all of these cases, the implication is that British and American speakers implement agreement differently.

Taken as an account of how British speakers carry out agreement in the course of normal speaking, these traditional assumptions find a challenge in our work. In this paper we develop a contrasting explanation for what American and British speakers do differently, examine what the differences imply for accounts of agreement in linguistic and psycholinguistic theories, and experimentally test the competing hypotheses about variations in collective agreement. The major hypotheses have to do with variability in the use of linguistic and nonlinguistic sources of number information in the implementation of agreement.

We first establish the existence and magnitude of the difference between British and American English in the use of plural verbs with collective subjects. Using controlled elicitation, normative ratings, and corpus counts, we then test alternative hypotheses about variations in

collective agreement. We consider (a) whether British and American speakers differ in sensitivity to the mereological information provided by discourse or other pragmatic information; (b) whether they differ in how they use mereological features (Sauerland & Elbourne, 2002) in the implementation of agreement, and (c) whether the lexical entries of collective nouns differ in the British and American lexicons.

1.0. LINGUISTIC AND PSYCHOLINGUISTIC APPROACHES TO AGREEMENT. Accounts of agreement in grammatical theory can be broadly divided into constraint-based approaches, such as Head-Driven Phrase Structure Grammar (HPSG; Pollard & Sag, 1994, chapter 2; Wechsler & Zlatic, 2003), and derivational approaches, such as Minimalism (Chomsky, 1995, chapter 2). The approaches take different stances on two basic questions about agreement. One question has to do with the nature of agreement features, and another with how agreement features are used by the grammar.

On constraint-based accounts, agreement features can have nonlinguistic, cognitive sources which determine the outcome of agreement. Importantly, referential indices provide values for number or gender features, so that whether a phrase is treated as singular or plural will be a matter of whether the referent of the phrase is a singleton or an aggregate. A referential index can be called upon not only by noun phrases but by other sentence constituents that carry feature values, including verbs. One implication is that agreement comes about when different clause or discourse constituents use the same referential index to determine their agreement features.

In contrast, agreement features in derivational accounts are formal features represented in and manipulated by the syntax or phonology. In Government and Binding treatments, the features that enter into agreement relations are represented in clause structure (e.g. Radford,

1988, ch. 6 and 9); in Minimalist frameworks, they may be represented as features of logical or phonological form (cf. den Dikken, 2001; Sauerland & Elbourne, 2002). Such features move, or trigger movement, within structural representations. The implication is that feature values appear where they do because of a formal relationship between the site of an agreement feature and the sites of agreement targets.

1.1 THE PSYCHOLINGUISTICS OF AGREEMENT. Psycholinguistic accounts of agreement split along lines that bear some similarities to those in linguistic theory. Both of the accounts that concern us grow out of theories of language production, and deal with how speakers make syntax out of nonlinguistic sense. A general framework for the production process is shown in Figure 1. Following Fromkin (1971), Garrett (1988), Levelt (1989), Dell (1986), and others, it consists of a nonlinguistic or prelinguistic *message*, which represents the referential and relational precursors of an utterance, including information potentially relevant to agreement features (such as nonlinguistic number and natural gender). We call these agreement-relevant message features notional features.

INSERT FIGURE 1 ABOUT HERE

Messages are linguistically realized in real-time processes that constitute *grammatical encoding* (Levelt, 1989). During grammatical encoding, abstract representations of words and morphemes are retrieved, syntactic structures are assembled, and words and structures are integrated to create morphologically instantiated representations of utterances that are suitable for phonological encoding.

Major approaches to agreement in psycholinguistic theory are concerned chiefly with processes that originate in message features, link the features to grammatical encoding, and realize the features on agreement targets. Vigliocco and Hartsuiker (2002) sketched an important

approach that emphasizes the semantic underpinnings of agreement processes, which they called Maximal Input. In supporting work, Vigliocco and colleagues proposed that the agreement features of controllers and targets have the same sources in nonlinguistic conceptual representations, but are independently assigned and later unified so that targets and controllers have the same values (Vigliocco, Butterworth, & Semenza, 1995; Vigliocco, Butterworth, & Garrett, 1996; Vigliocco, Hartsuiker, Jarema, & Kolk, 1996). A related approach emphasizes the constraint satisfaction nature of agreement, echoing the linguistic account of Pollard and Sag (1994), and asserts the importance of correlations in form and meaning among agreeing elements (Haskell & MacDonald, 2003; Thornton & MacDonald, 2003).

Another view, dubbed Marking and Morphing, identifies two major mechanisms that work together during the implementation of agreement (Bock, 2004b; Bock, Eberhard, & Cutting, 2004; Eberhard, Cutting, & Bock, in press). The first mechanism, marking, is similar to but more restricted than what is proposed in Maximal Input. Its function is simply one of linking nonlinguistic representations to corresponding linguistic elements. The restriction to corresponding elements means that the notional referents of, for example, arguments (in the logical sense) control feature values of noun phrases. For a language to directly mark a verb phrase, the notional underpinnings of predicates would have to be evaluated in terms relevant to number or other features (which seems to be relatively common in native North American languages; Durie, 1986; Mithun, 1988). When the same notional referent happens to control different linguistic constituents, making the constituents co-referential, they are likely to bear the same values of agreement features. Among other things, this mechanism yields agreement between pronouns (including both personal and reflexive pronouns) and their discourse or sentential antecedents, as in anaphoric (Bresnan & Mchombo, 1987) or pragmatic (Wechsler &

Zlati´c, 2003) agreement. We call agreement that is the product of co-marking *concord* (note that this usage of the term differs from that of Wechsler & Zlati´c, 2003).

The second mechanism, morphing, forges a linguistic-structural link between agreement controllers and agreement targets. In some kinds of agreement (including subject-verb number agreement in English), the nonlinguistic correlates of agreement features are initially marked on controllers only, rather than on the linguistic targets of agreement (as Maximal Input urges). Under these circumstances, agreement targets must be bound to the linguistic representations of their controllers' agreement features in the course of grammatical encoding, creating the apparent directionality in agreement that is associated (for instance) with subject-verb agreement in English. The product of morphing is agreement *control*.

The broad outlines of the marking-and-morphing proposal are sketched in Figure 2 for verb and pronoun agreement, mapped onto the framework of the production architecture shown in Figure 1. The key elements shown are the valuation of notional number, number marking, and number morphing. We review these in turn.

INSERT FIGURE 2 ABOUT HERE

The valuation of notional number takes place during preverbal encoding in the message, creating a representation of the speaker's communicative intention or referent model. The purpose of valuation is to distinguish notional singulars from notional plurals in the referent model, creating what Figure 2 calls units (notional singletons) and multitudes (notional aggregates). Valuation is a matter of judgment or construal. It is weighted toward unity as a stable or default state, with construal of something as an aggregate resting on the presence of perceptual and conceptual features that deviate from the default in ways analogous to violations of Gestalt grouping principles (Jackendoff, 1983, 1991; Wertheimer, 1923).

Marking is part of functional assembly. Functional assembly proceeds on the basis of constraints imposed from the message to marshal the lexical and syntactic raw materials for an utterance. Marking transmits the notional number valuation into the syntax in the form of features of an utterance's structure, and into the lexicon via the recruiting or *nomination* of lexical entries whose meanings are consistent with the notional valuation of message elements.

Morphing helps to create linguistic representations that can support phonological encoding. It is part of structural integration, which binds lexical and structural forms together. Whereas functional assembly proceeds incrementally on the basis of constraints imposed from the message to be expressed, structural integration proceeds incrementally on the basis of constraints imposed from the lexicon and syntax. In line with general functions of structural integration, morphing (a) reconciles number-relevant features from the syntax and the lexicon within grammatically defined domains and (b) transmits number features to structurally controlled morphemes so as to reconcile the number features of controllers and targets. The former is associated with agreement concord and the latter with agreement control.

The workings of this account can be illustrated in terms of antecedent-pronoun and subject-verb number agreement in English (respectively, pronoun and verb number agreement, for short). Verb and pronoun number both originate in message valuations, but they differ in how they come to reflect message-based number valuations. Personal pronouns carry a number with them from the lexicon and their phrases may be marked in the syntax, as well. Normally, when a pronoun is coreferential with another number-bearing noun phrase, their numbers will agree because of the normal satisfaction of number semantics that occurs during marking and lexical nomination. As described above, this constitutes agreement concord. Verb number, in contrast, reflects number valuation only indirectly, because verbs inherit the number of the subject noun-

phrase during structural integration. This constitutes control of verb number by the subject number.

Psycholinguistic evidence for the workings of marking and morphing was reported for American English by Bock et al. (2004). As in most laboratory work on agreement since Bock and Miller (1991), Bock et al. relied on the phenomenon of *attraction* (Jespersen, 1924) to introduce variability into the realization of agreement. Table 1 gives attested examples of plural attraction for verbs and pronouns. In attraction, agreement features from a noun phrase that is not the canonical controller of agreement appear on an agreement target. The noncanonical controller is sometimes called an attractor, an interloper, or a local noun-phrase; here we call it an attractor. Grammatically plural attractors are much more potent than singulars, presumably due to plural specification (and the absence of specification for singulars; Eberhard, 1997). Evidence suggests that the plural features of attractors migrate to the site from which the agreement features of the controller are normally transmitted to the agreement target, rather than being directly linked to the target. Among other things, the structural depth of an attractor matters more than linear distance (Bock & Cutting, 1992; Vigliocco & Nicol, 1998) and the semantic properties of attractors are less important to attraction than the semantic properties of controllers are to agreement (Bock et al., 2001). Other kinds of agreement errors may be more dependent on the meaning of a spurious controller, stemming from predication confusion (cf. Bock & Miller, 1991, Experiment 3; Thornton & MacDonald, 2003).

INSERT TABLE 1 ABOUT HERE

In their work, Bock et al. (2004) relied on the elicitation of sentence completions that contained finite verbs or tag pronouns. The controllers of the verbs and the antecedents of the pronouns were subject noun-phrases contained in so-called preambles that speakers produced

aloud and then completed. Crucially, the same noun phrases served as the subjects of verbs and the antecedents for pronouns, and across conditions they varied in different ways in number meaning and number morphology. The variations are illustrated in Table 2. Different experiments were designed to examine the effects of variations in notional number that cooperated or competed with the conventional grammatical number of the subject (and antecedent) noun phrases.

INSERT TABLE 2 ABOUT HERE

Consistent with the marking-and-morphing account of the mechanisms behind concord and control, pronouns were substantially more likely than verbs to display a grammatical number that accorded with notional properties of the subject noun phrase. Although verbs, too, were sensitive to notional number properties, pronouns were much more so (see also Bock, Nicol, & Cutting, 1999). The marking-and-morphing account of this difference is in terms of the direct bequest to the nominal elements involved in concord (noun phrases and pronouns) of the number meaning of their nonlinguistic referents, compared to the indirect, linguistically mediated control relationship between grammatical number features of linguistic controllers and targets (subjects and verbs).

These agreement results are consistent with longstanding observations about differences between verbs and pronouns in sensitivity to notional number (e.g., as codified in the Agreement Hierarchy of Corbett, 1979, 2000, with its associations to the Animacy Hierarchy; Comrie, 1981; Smith-Stark, 1974; see also Joosten, DeSutter, Drieghe, Grondelaers, Hartsuiker, & Speelman, 2004). Taking the psycholinguistic evidence for marking-and-morphing beyond the claims in the Agreement Hierarchy was a key dissociation in the behavior of verbs and pronouns with respect to agreement and attraction. Though pronouns were much more likely than verbs to convey

notional number in agreement, in attraction they were no more likely than verbs to convey the notional number properties of attractors. Indeed, like verbs, they appeared to be sensitive only to the grammatical properties of the attractors. This result is ascribed to the normal workings of agreement control, taken to be the transmission of agreement features from a controller to a target. In attraction, the features of the controller are disrupted or displaced by those of the attractor, but then transferred as usual to the target.

This similarity between verbs and pronouns in attraction serves to rule out several alternative accounts of the difference between them in agreement. First, verbs and pronouns typically differ in their structural and linear positions with respect to their putative controllers or antecedents. These distributional variations on their own have been seen as creating differences in sensitivity to notional number: In grammatical gender languages, it is often observed that the likelihood of grammatical gender agreement between pronouns and their antecedents decreases with increasing distance (Drosdowski, 1984). However, in attraction, there is no difference between verbs and pronouns in sensitivity to notional number, even though the same relative differences in distance hold in attraction as in agreement (i.e., verbs tend to be closer to their attractors than pronouns are). In attraction, neither verbs nor pronouns display notional sensitivity, and pronouns occur in different clauses than their attractors without displaying sensitivity to the attractors' notional number (Bock et al., 2004).

Second, the normal difference between verbs and pronouns in notional sensitivity might be attributed to consistent differences in their linguistic nature: Verb inflections could be treated as bound elements selected on the basis of grammatical properties and pronouns as free elements selected on the basis of their semantics. However, the vulnerability of pronouns to attraction, and

the equality of verbs and pronouns as targets of attraction, suggest that verbs and pronouns are both checked against grammatical agreement properties that are in play in utterances.

The marking-and-morphing account suggests more detailed hypotheses about the nature of the difference between British and American English with respect to collective agreement. Moreover, the account makes specific predictions about how, under alternative hypotheses, British and American agreement should pattern in terms of divergences and convergences between verb and pronoun number in agreement and attraction. The next section sketches the three leading possibilities.

1.2. THREE ACCOUNTS OF BRITISH AND AMERICAN COLLECTIVE AGREEMENT. In terms of marking-and-morphing mechanisms, there are three simple ways in which British and American English could come to display different patterns of collective agreement. The first two are psycholinguistically specific versions of the hypothesis that British speakers use the meaning of collectives in a way that differs from American speakers; the third hypothesis is that it is not the meaning but the number specifications of collectives that differ in the two dialects. The three hypotheses involve (a) different resolutions of notional number ambiguity; (b) different sources of number constraint; and (c) different lexical specifications, or what is informally called grammatical number.

HYPOTHESIS 1: DIFFERENT RESOLUTIONS OF NOTIONAL AMBIGUITY. The first hypothesis is a version of the traditional view that British collective agreement reflects number semantics. According to hypothesis 1, American collective agreement also reflects number semantics, but a number semantics that is different from British English. So, this view accords well with the Maximalist Input claim that number meaning permeates agreement. But, on this hypothesis, it just so happens that collective meanings differ between American and British English.

Specifically, hypothesis 1 is that the difference between American and British collective agreement is due to different biases regarding the resolution of ambiguities in collective and distributive senses. Collections of all kinds can be construed either as singleton sets or as aggregations of individuals; even a skeleton might be seen as a set or as an aggregation of bones. If British speakers are more inclined to resolve such ambiguities in favor of an aggregate or distributive sense and American speakers are more inclined to resolve them in favor of the set sense, the observed differences in agreement would result. The hypothesis can be summarized as predicting that American speakers see a forest where British speakers see trees.

In terms of proposed psycholinguistic mechanisms of agreement, this hypothesis entails no fundamental conflicts between the dialects. For instance, on the marking and morphing account, British speakers would be more likely than Americans to mark as plural those subject noun phrases or pronoun phrases that have collective referents, as a consequence of the bias toward distributive resolutions of ambiguous number situations. However, the ensuing workings of agreement would not otherwise differ. On this view, the expected variations in overt agreement, apart from the familiar difference in collective verb agreement, involve pronoun number: Since pronouns are more sensitive than verbs to variations in the notional number of their antecedents, this hypothesis predicts that pronoun number in British English, relative to American English, should track and magnify any verb number effects. That is, when verbs tend to be plural, pronouns should also tend to be plural, more strongly, and especially so in British English, due to the effects of concord working over and above the effects of agreement.

HYPOTHESIS 2: DIFFERENT SOURCES OF NUMBER CONSTRAINTS. The second hypothesis comes closer than the first to the spirit of the traditional account. The presupposition of most claims that British speakers use variations in number meaning in the implementation of

collective agreement is that American speakers do not. Presumably, what American speakers call on are the lexical specifications, the grammatical number, of collective heads.

The Mereology feature proposed for British English by Sauerland and Elbourne (2002), and the absence of the feature from American English, is one instantiation of this hypothesis. On constraint-based views of agreement, the hypothesis can be stated in terms of contrasting sources of number constraint. In setting the index that is consulted by agreeing elements, British speakers should rely on the message features or notional valuations of the number context to a greater extent than American speakers, who rely instead on distributional features of the linguistic context. Presumably, in the course of language acquisition, British children would come to acquire sensitivity to and ability to use notional variations in the implementation of collective (and other kinds of) agreement, while American children would come to acquire sensitivity to and ability to use properties of collective (and other kinds of) head nouns. In general, the upshot would be agreement systems that differ substantially in how they combine notional and lexical information during the implementation of agreement, with British speakers giving greater weight to notional than lexical number.

In collective contexts, this hypothesis predicts several contrasting patterns between agreement and attraction and between verb and pronoun agreement in British and American English. One prediction is that the same kinds of variations that characterize agreement with collective subjects should characterize attraction to collective attractors, albeit more weakly (see Thornton & MacDonald, 2003, for a specific example of this constraint satisfaction prediction). This hypothesis was explicitly tested for American speakers by Bock et al. (2004) and disconfirmed. A second prediction is that when the notional aggregation behind a collective subject is enhanced by the nonlinguistic context, British speakers should be much more likely

than American speakers to use plural verb agreement. So, if British agreement is driven by deep, logical, meaning-based evaluations of numerosity in the cognitive context whereas American agreement is driven by superficial grammatical number properties, the enhancement of notional aggregation should have greater effects on the agreement of verbs with collective heads for British than for American speakers.

HYPOTHESIS 3: DIFFERENT LEXICAL SPECIFICATIONS. The third hypothesis returns to the possibility that British and American agreement work in the same ways but call on different values of an agreement feature. The agreement feature in question reflects not notional number (as in the first hypothesis), but lexically specified number. In particular, speakers of British and American English may associate different grammatical number values with collective nouns. By lexically governed convention, some speakers of British English treat nouns such as team and government as plural, in the same way that some speakers of American English treat the noun faculty as plural. More accurately, some speakers of British English treat the categories of sports-team denoting nouns and names, and corporation-denoting nouns and names, as plurals by default, whereas American English speakers treat them as singulars by default. So, in the same way that new members of the trousers category (e.g., capris) are plural by default, some categories of collectives may be plural (and their new members treated as plural), regardless of variations in the circumstances in which they are used. The variability is not notionally controlled, but lexically controlled.

The novel prediction from this hypothesis has to do with the impact of collective attractors. Bock et al. (2001) and Bock et al. (2004) have shown that the notional properties of collective nouns in American English have little to no ability to create attraction, either for verbs or for pronouns. Attraction appears to emanate from grammatically specified plurals only, and in

marking-and-morphing terms, this is attributed to the resolution of phrasal number properties with lexical number properties that occurs during the implementation of agreement control. If the restriction of attraction to grammatically specified plurals holds in British as well as American English, and certain collectives are grammatically specified as plurals, the third hypothesis predicts a degree of attraction from collectives proportional to the likelihood of plural specification. So, relative to singular count controls, collective attractors should yield attraction proportional to other plural nouns.

This prediction is challenged in the work of den Dikken (2001), who argued that collectives do not attract. In general, this seems to be true: Bock and Eberhard (1993) and Bock et al. (2004) both found no attraction to collectives. However, the research was done in American English, and with collectives that most American English speakers, most of the time, treat as singular. Moreover, if collective attraction does occur, its effects are likely to be subtle: The strength of attraction is modulated by the relative frequency of contrasting forms (Bock et al., 2004), such that invariable plurals and plurals with very low frequency singulars are weaker attractors than variable plurals and plurals whose contrasting singulars are high in frequency. Collectives tend to have very low frequency plural forms or lack them entirely (cf. *clergy, people, cattle, police*). Idiolectal differences exacerbate the difficulty of observing collective attraction by increasing variability among and within speakers. But with suitable controls and estimates of the likelihood of plural specification, the marking-and-morphing contention is that attraction from collectives should occur.

1.3. SUMMARY AND PREVIEW. Linguistic and psycholinguistic accounts of agreement differ along parallel dimensions involving the nature of agreement features and the ways in which features are used in the grammar and by speakers. On one set of views, features have a

conceptual or referential basis that is essential to their explanation; on another, features are formal or abstract linguistic properties. On one set of views, agreement features are tapped conjointly by all the linguistic elements that bear them, giving the features a uniform interpretation; on another, agreement features are structural bonds between controllers and targets. The marking and morphing approach to agreement is a psycholinguistic theory that bridges these views, proposing that agreement can originate in notional features but rely on lexical and abstract syntactic features during implementation. On this approach, the properties of verb and pronoun agreement reveal how the lexicon and syntax work together to realize two forms of agreement, concord and control, that respectively maximize the interpretative and structural components of agreement implementation.

Collective agreement in British and American English offers an explanatory challenge and a test of alternative hypotheses about how agreement works, linguistically and psycholinguistically. Three competing predictions emphasize different combinations of conceptual, structural, and lexical constraints on the implementation of agreement in the two dialects, with co-variations in verb and pronoun agreement serving to diagnose the nature of agreement features. The following sections report research that was designed to test the competing hypotheses, using a combination of corpus analysis, normative assessment, and experimental testing.

2. Agreement in British and American English: Normative variations

2.1. Methods and materials. The first set of studies was designed to better document and quantify the variations between British and American English in the use of plural number when an agreement target's controller or antecedent has a collective head. We gathered two

types of data from British and American speakers and writers. First, to assess verb agreement using matched collective and noncollective materials under comparable conditions, we elicited spoken sentence completions from American and British college students. The collective nouns sampled were chosen from a dictionary of collectives (Sparkes, 1985) to represent a range of human (e.g., team, committee), non-human animate (e.g., herd, flock), corporate (government, association), and ostensibly inanimate (e.g. fleet, forest) groupings. Second, for a subset of these collectives we carried out counts of singular and plural verb and pronoun agreement with collective controllers in the Wall Street Journal corpus and the British National Corpus.

SPOKEN SENTENCE COMPLETIONS. To compare the incidence of plural agreement after collective controllers with the incidence of plural agreement after semantically related plural and singular noncollectives, 39 students at Michigan State University and 39 students and research workers at Cambridge University provided spoken sentence completions. The completion test was assembled from 96 triplets of semantically related nouns. Each triplet consisted of a collective (e.g., army), a semantically related noncollective singular (e.g., soldier), and the corresponding plural (e.g., soldiers). Three lists of 96 simple definite noun phrases were assembled from these triplets, with one noun in each noun phrase (e.g., The army). Every list contained one noun from every set and an equal number of nouns of each of the three types (collective, singular, and plural). Across the three lists, every noun occurred just once. The order of the nouns within lists was random, constrained so that there were no more than two successive occurrences of the same kind of noun. The same random order was used for all three lists, so that nouns from the same triplet occurred in the same ordinal position in every list. Each list began with the same four practice items, consisting of two noncollective singulars and two noncollective plurals that differed from the noun phrases used within the lists.

The phrases were presented to participants individually under computer control, each phrase appearing centered on the computer monitor. Where there were spelling discrepancies in American and British (e.g., neighbor/neighbour), the spelling presented was the appropriate one for the dialect. Participants were asked to read the phrase aloud and complete it as a simple sentence, as fast as possible with the first thing that came to mind. The speakers were instructed by example to use completions consisting of the copula be and a predicate adjective. On each trial, when the participant began to talk the experimenter cleared the computer screen. At the completion of the trial, the participant pressed the computer's mouse to move on to the next phrase.

An additional sample of spoken completions was gathered from 13 British exchange students in residence at Michigan State University. Each of the British students received the entire set of 288 definite noun phrases arranged in one of six random orders, preceded by the same four practice trials. In other respects the procedure was the same as described above.

The participants' responses were recorded, transcribed, and scored. The scoring noted whether the verb used was singular, plural, or other. The other category covered any cases in which the verb could not be unambiguously scored as singular or plural or the subject noun-phrase was inaccurately produced.

CORPUS COUNTS. The part-of-speech tagged Wall Street Journal corpus and British National Corpus were searched for occurrences of the subset of collective nouns listed in Appendix B. To better equate the subject matter of the American and British texts, the search in the British National Corpus was restricted to the domain of finance and commerce. When a collective served as the subject of a clause or as the same-sentence antecedent of a third-person pronoun, and was not part of a proper name, the verb or pronoun agreement target was hand

coded as singular, plural, or unspecified (for verbs with morphologically invariant number, such as past tense verbs). The search in the Wall Street Journal corpus was exhaustive. In the British National Corpus, the number of tokens for each collective was set at a maximum of 300, sampled at random from all of the texts within the domain. For the two sources, Appendix B gives the distribution across the collective nouns of the incidence of verb and pronoun tokens with unambiguous number.

2.2. NORMING RESULTS. For the sentence completions, Table 3 shows the overall proportions of plural verbs (out of the unambiguous singulars and plurals) produced for each type of subject noun-phrase by the Americans in Michigan, the British speakers in England, and the British exchange students tested in the United States. For the American and British students the proportions are based on a possible 416 responses per cell, and for the British exchange students on a possible 1248 per cell. To assess the statistical significance of the observed differences between the British and American speakers, an analysis of variance was performed on the proportions of plurals for each item, treating items as the random factor. This analysis showed a significant effect of the head noun ($F(2,95)=167.9$), due to the substantial differences among singulars, plurals, and collectives in the tendency to elicit plural verbs. There was also a significant effect of the norming group ($F(2,190)=65.7$) along with a significant interaction between the norming group and the type of head ($F(2,190)=58.1$). Both of the latter effects stem from the difference between the Americans and the two British groups in the production of plural verbs with collective heads. Together, the British were about ten times more likely than the Americans to use plurals with collectives (.20 to .02), but the groups did not differ in the use of plural verbs after noncollective singular and plural head nouns.

INSERT TABLE 3 ABOUT HERE

For the corpus counts, Table 4 gives the proportions of plurals (out of the total number of singulars and plurals) that occurred among verbs and pronouns in each dialect. For both dialects the proportion of plural pronouns was higher than the proportion of plural verbs, and this difference was considerably larger for American than British sources. Comparing across dialects, plural verb agreement with collectives was much more frequent in British than in American English (.26 to .07), whereas the corresponding difference for pronouns was small (.42 to .38). Pearson product-moment correlations were performed between the verb and pronoun plural proportions within each dialect and between the British and the American plural proportions for each target type. There was a substantial correlation between verbs and pronouns in British English (r =.71), but the same correlation for American English was a negligible -.05. For pronoun number, the correlation between British and American sources was .25, and for verb number it was .32. These moderate positive correlations between the dialects imply some similarities in which pronouns and verbs tend to be treated as plural in agreement. Notably, the magnitudes of these correlations are similar for pronouns and verbs.

INSERT TABLE 4 ABOUT HERE

2.3. DISCUSSION. Both the norming and the corpus counts revealed substantial differences between British and American English in the use of plural verb agreement with collective subjects. The magnitude of the disparity varied, ranging from a tenfold difference for spoken sentences produced under controlled conditions to a fourfold difference for written sentences sampled from financial newspapers. There are obviously many reasons why these estimates might differ, but the important point for present purposes is that American and British speakers vary substantially in how they treat verb agreement with collectives.

The corpus counts for pronouns with collective antecedents revealed no such difference, tending instead toward plural agreement in both dialects. On the assumption that the pronouns reflected discourse agreement rather than grammatical agreement, this suggests that British and American speakers are less at odds over the notional aggregation of the normal referents of collectives. However, this assumption can be challenged. Although the pronouns sampled from the corpus appeared in the same sentences as their antecedents, they constituted a mix of reflexive and other pronouns. In addition, their positions with respect to their antecedents varied. To better compare British and American speakers' use of notional number in pronoun agreement, Experiment 1 examined the distributions of plural and singular pronouns when the pronoun types and antecedent locations were known.

3.0 Experiment 1

3.1 Introduction.

The goal of the first experiment was a controlled test of the hypothesis that British speakers, when implementing pronoun agreement during production, tend to be more sensitive than American speakers to variations in number within the message underpinning an utterance. The number in the message is assumed to be the notional or discourse-relevant number of the pronoun's referent. If the referent is a group introduced by a collective noun, the notional number can be ambiguous between a collective (singular) and distributive (plural) construal (see Joosten, et al., 2004, for an in-depth analysis of the variations among collective nouns in their openness to this possibility). With plural-biased construals, if British speakers are more likely to attend to notional number, they should be more likely than Americans to use plural pronouns distinctively.

To create distributively-biased construals, the collective-headed noun phrases used in this experiment (and the next) included plural postmodifiers in one experimental condition. These plural postmodifiers have two consequences. The first is to enhance the distributive potential of the collective head. Joosten et al. (2004) described such enhancement in terms of increased accessibility of the entity level (roughly the same as what we have called the distributive construal) of a collective. For example, *the committee from the unions* implies representatives of multiple constituencies, individuating the committee members in a way that *the committee from the union* is less likely to. Humphreys and Bock (in press) found that individuation of the members of collectives increased the tendency for American English speakers to treat the collectives as plurals by about 8%, relative to controls; Bock et al. (1999) found an increase of 16%.

The second consequence of plural postmodifiers is attraction. To distinguish the effects of attraction from those of the enhanced plurality of the collective, Experiments 1 and 2 employed control conditions in which the same plural postmodifiers used after collective heads also accompanied noncollective singular heads (e.g., *the representative of the unions*). By comparing the incidence of plural agreement targets in this condition to the incidence in a condition in which the postmodifiers were singular (e.g., *the representative of the union*), the rate of attraction can be estimated. With the same logic and similar materials, Bock et al. (1999) showed that attraction increased the use of plural pronouns (and plural verbs) by an average of 8%. The expectation for Experiment 1 was that the effect of distributive bias should be observable by an increase in the use of plural pronouns over and above the effects of attraction.

British and American speakers could differ in their use of notional number when implementing discourse agreement but nonetheless use grammatical number in the same way

when implementing grammatical agreement. To examine this possibility, we elicited two different types of pronoun agreement. The first, tag-pronoun number agreement, was expected to yield more discourse agreement due to the distinct clause membership of the pronoun and its putative antecedent. The second, reflexive-pronoun number agreement, should yield more grammatical agreement because of the binding relationship between the reflexive pronoun and its controller. If British and American speakers differ in how they deal with discourse agreement but not in how they deal with grammatical agreement, we should see differences in the use of singulars and plurals for tag pronouns but not for reflexive pronouns.

So, in the first experiment we elicited pronouns under controlled circumstances that allowed a more incisive evaluation of British and American speakers in their sensitivity to notional and grammatical number. We used two elicitation conditions with different grammatical contexts. The contexts were matched in the properties of the controllers but varied in the properties of the agreement relationship between the antecedents and the pronouns, as illustrated in Table 5. In the tag-pronoun condition, we elicited spoken completions to sentence fragments with collective heads, such as *The crew with the peacekeeping forces caroused…*; in the reflexive pronoun condition, we elicited spoken completions to sentence fragments with the same heads but different, reflexive-compatible verbs, such as *The crew with the peacekeeping forces fooled…* The collective-head conditions were contrasted with noncollective singular (e.g., *sailor*) and plural (*sailors*) heads followed by the same prepositional phrase postmodifiers, which provided baseline estimates for the use of singular and plural pronoun agreement (see Appendix C for the complete set of materials).

INSERT TABLE 5 ABOUT HERE

3.2 METHOD. *Participants*. There were 384 participants in total, half British and half American. The British participants were 192 students at Cambridge University or college preparatory students in their final year of study. All were under 30 years of age and native speakers of British English (i.e., British English was the only language spoken in their childhood homes). They were without recent or extensive first-hand experience with North American English. They were paid a small sum for their service. The Americans were 192 students at the University of Illinois who took part either to partially satisfy an introductory psychology course requirement or for a small payment. They were native speakers of American English and without recent or extensive first-hand experience with British English.

Equipment. The British participants were run on either a Macintosh Powerbook 540 or 1400 with a 15‘ external monitor (Sony Trinitron model CBF 15 SF). Voice recordings were made over an AKG 1000 CS stand microphone connected to either an HHB PortaDAT 1000 digital tape recorder or a Marantz analog tape recorder via a Symetrix pre-amplifier. The Americans were run on a Macintosh Quadra 650 with a 17’ Apple Multiple Scan monitor. Voice recordings were made over a Shure head-worn microphone (SM10A) amplified by an Applied Research and Technology Professional Tube Mic Preamplifier connected to a digital-audio (Sony DTC-ZE700) or audio cassette (Realistic SCT-84) recorder. The experiment-running software was PsyScope version 1.1 (Cohen, MacWhinney, Flatt, & Provost, 1993) and identical PsyScope scripts were used in England and the United States to ensure equivalent timing of experimental events.

Materials. The 36 experimental items were designed to elicit number-marked tag and reflexive pronouns from speakers. Each item consisted of a set of preambles (sentence initiations) containing a complex subject noun-phrase and a regular past-tense verb. Appendix C

gives a schematic description of all the items, and one item is illustrated in full in Table 5. As Table 5 shows, there were 12 versions of each item, involving six basic variations for eliciting each of the pronoun targets. The only difference between the preambles for the alternative pronoun targets was that the verb was intransitive in the tag-eliciting preambles, and transitive-reflexive in the reflexive-eliciting preambles. The six variants on these two preamble conditions were created from three types of head nouns (noncollective singular, noncollective plural, or collective) combined with two types of local attractors (noncollective singular or noncollective plural). For economy, we will refer to the noncollective singulars and noncollective plurals simply as singulars and plurals.

An additional 48 preambles served as filler items. These were more diverse in structure than the experimental items, and included simple as well as complex noun phrases. Thirty of the fillers contained plural head nouns, so that in each list there was a total of 42 plural-headed subject noun phrases. Every participant received the same set of these, modified according to pronoun condition to conclude with an intransitive or reflexive verb.

Twelve lists of 84 preambles were constructed from these materials. Every list began with six filler preambles, followed by a random arrangement of experimental and filler preambles constrained so that there were no consecutive experimental trials. The same random arrangement of filler and experimental items was used in all lists.

Six of the lists contained only tag-eliciting preambles and the remaining six contained reflexive-eliciting preambles. Every list contained one version of each of the 36 experimental items, and six preambles from each combination of type of head noun (singular, plural, or collective) and type of attractor (singular or plural). Across lists, every version of every item occurred exactly once.

Procedure. Table 6 gives a schematic description of the experimental procedure. The preambles were displayed one at a time in 18-point Palatino font on a computer monitor. Participants were instructed to read each preamble, produce it aloud, and complete it using a pronoun. Half the participants in each dialect group received instructions for completing the preambles with reflexive pronouns, and half received instructions for completing the preambles with tag pronouns. Participants in the respective groups were given examples of reflexive pronouns (specifically, herself, himself, itself, themselves, and ourselves) or of tag questions, which were described as 'the little questions that people sometimes put at the end of sentences, like 'She's crazy, isn't she?' or 'He's not there, is he?' The instructions also included examples of the completions expected, without any information about the number or other agreement properties of the preambles or the pronouns themselves. Practice trials followed, to ensure that participants said the preamble aloud and correctly. They were encouraged not 'to think too long about what to say' and 'to talk as fast as you can.'

INSERT TABLE 6 ABOUT HERE

Two different presentation procedures were employed, balanced across the dialect and pronoun groups. The procedures differed in the amount of time provided for reading the preambles, with one allowing the preamble to be read aloud from the screen and the second requiring the preamble to be reproduced from memory. With read-aloud presentation, each preamble was revealed by a mouse click, and when the participant began to utter the final word of the preamble, the experimenter blanked the screen. With reproduction presentation, a centered fixation point (a plus sign) initiated the trial. A mouse click revealed the preamble, which remained in view for an amount of time that allowed it to be read through once, silently, by most participants. The duration was determined by a formula that adjusted for the length of the

preamble. Total presentation time was a constant 250 ms per character, plus an additional 25 ms for each function-word character and an additional 40 ms for each content word character. The preamble was followed by a display containing an exclamation point as the signal to begin speaking.

With both procedures, participants completed the preambles with either a reflexive or tag pronoun. Equal numbers of British and American speakers received each of the 12 experimental lists under each of the two presentation procedures, so that the same numbers of participants were exposed to each combination of materials in all conditions.

Scoring. The responses on the experimental trials were transcribed from the audio tapes and scored for the number of the pronoun in the sentence completion. There were two types of valid responses, classified as Plurals and Singulars. Pronouns were scored as Plural or Singular only when the preamble was correctly reproduced, spoken just once, and the completion contained an unambiguously plural or singular pronoun of the targeted kind (i.e, a tag pronoun in the Tag condition and a reflexive pronoun in the Reflexive condition). Examples of Plural responses from the condition with plural attractors are presented in Table 7, accompanied by an example Singular response for the same item in the same condition.

All other responses were assigned to one of several defective-response categories. These categories included incorrect preamble repetitions (generally, changes in the number of the head noun or attractor), completions that omitted pronouns, and rare completions in which the pronouns were anomalous (e.g., reflexive forms such as himselves).

INSERT TABLE 7 ABOUT HERE

*Data analyses***.** Analyses of variance were performed on the proportions of valid Plural responses for each participant and each item in each cell of the experimental design. The

proportions were calculated relative to all valid Plural and Singular responses in each condition for each type of preamble. Prior to analysis the proportions were arcsin transformed (Smith, 1976). Analyses were performed with both participants and items as random factors using the min F' statistic (Clark, 1973). Unless otherwise indicated, effects reported as significant were associated with probabilities less than or equal to .05, and the corresponding test statistics are summarized in Appendix D.

Type of preamble presentation (read-aloud or reproduction) was treated as a separate factor in the analyses. Because the major findings were similar regardless of presentation mode, we omit differences associated with presentation from the results and discussion.

3.3 RESULTS. Figure 3 presents a summary of the results in terms of the proportions of plural tag and reflexive pronouns produced. Tables 9 and 10 give the raw numbers of singular and plural responses in each subject noun-phrase condition for tags and reflexives respectively. The main entries are totals over the two tasks (read-aloud and reproduction); in parentheses are the results from reproduction only.

INSERT FIGURE 3 ABOUT HERE

The statistical analyses confirmed that both the type of head noun and the plurality of the attractor affected the proportion of plural responses. Significantly different proportions of plural pronouns occurred with different types of head nouns, with .09 plural after singular heads, .60 after collective heads, and .98 after plural heads. Significantly more plurals accompanied plural than singular attractors, .60 to .51.

INSERT TABLES 8 AND 9 ABOUT HERE

More notable was the absence of variation in the magnitude of these differences associated with dialect and with type of pronoun. None of the effects of head or attractor type

changed significantly depending on the pronouns produced or on the dialects of the speakers. American and British speakers produced similar proportions of plural tags (.53 and .56, respectively) and plural reflexives (.54 and .57, respectively), and succumbed to attraction at similar rates (with increases in plural agreement after plural attractors of .12 and .08 respectively). The overall proportions of plural pronouns used with collective subject noun phrases was slightly higher for the American than for the British speakers (.63 to .57), but not significantly so. In short, the similarities across speakers in pronoun use were more striking than any differences, as were the similarities in number for the reflexive and tag pronouns.

3.4 DISCUSSION. Pronoun elicitation yielded strong evidence that both American and British speakers regard collectives as notionally plural. Relative to singular head nouns, singular collectives were substantially more likely to elicit plural pronouns. They were also substantially *less* likely than plural heads to elicit plural pronouns. This suggests that as antecedents they fall between individual singulars and plurals in notional number, or that speakers vary more in their tendencies to treat collectives as plurals. Most important was the finding that whatever the source of this variation for collectives, it yields the same results for the two dialects. British speakers are neither more nor less likely than American to use plural pronouns after collective antecedents.

Reflexive and tag pronouns were very much alike. This runs counter to the natural expectation that reflexive pronouns should reflect discourse agreement less than tag pronouns: They occur in the same clause with their antecedent, are closer to their antecedent, and are structurally bound to their antecedent (Chomsky, 1981). Nonetheless, reflexives as well as tags tended to be plural when their antecedents were collectives, and to the same degree. The equivalence of reflexives and tags in their number agreement properties replicates a finding from Bock et al. (1999) for American speakers. Apparently, the number features of pronouns are

determined in a way that is not sensitive to the structural locations of their antecedents, and separately from binding constraints.

There was also a trend toward increased use of plural pronouns after plural attractors. This is normal attraction (Bock et al., 1999; 2001; 2004). For both pronoun types the magnitude of attraction was the same for British as for American speakers, suggesting that speakers of both dialects are vulnerable to the spurious use of agreement features. Further, the absence of differences between reflexives and tags reinforces the evidence that number features are determined in the same ways for both kinds of pronouns. Since the sources of number information involved in canonical agreement and attraction differ (Bock et al., 2001; 2004), the similarities between tags and reflexives suggest that these sources of number come together independently of the mechanisms that determine the agreement target.

In tasks of the present kind, it can be objected that speakers do not consider the sense behind what they are producing, with the implication that speakers are not observing meaning differences that they would otherwise be sensitive to. In order to address this objection, we carried out parallel notional number norming tasks in England and the United States. In these tasks, 120 judges (60 British and 60 American) received the preambles from the experiments and were asked to indicate whether they thought the referents of the phrases represented 'one thing' or 'more than one thing.' The preambles were divided into lists so that judges saw only one version of each item, and ten judges rated every version.

The results are shown in Table 10, in terms of a measure in which 1 is the maximum 'one thing' rating and 2 is the maximum 'more than one thing' rating. There were consistent, significant differences in the notional ratings that paralleled the pronoun results, but again, no differences between the British and American speakers. In an analysis of variance with items as

the random factor, only the type of head (collective, singular, plural) produced a significant effect, $F(2,140) = 2817$. The effect of dialect was negligible, $F(1,70) = .10$, $p > .75$. These results converge on the same interpretation as the pronoun elicitation findings: Speakers of British and American English are virtually identical in their sensitivity to variations in notional number.

INSERT TABLE 10 ABOUT HERE

4.0. EXPERIMENT 2: VERB AGREEMENT WITH COLLECTIVE SUBJECTS. Experiment 2 was designed to test an alternative version of the hypothesis that British speakers are more attentive or sensitive to notional number variations than American speakers. The corpus analysis, the first experiment, and the notional number judgments all suggest that differential attention or sensitivity is not responsible for the divergent patterns of agreement with collective nouns in British and American English. The alternative hypothesis, hypothesis 2 in section 1.2.2, is that in subject-verb agreement, the source of the controlling information for agreement is different in the two dialects. Specifically, it may be that when verb number is at issue, British speakers are more likely than American speakers to tap into notional information, while Americans are likely to call only on the grammatical number specifications of head nouns.

This hypothesis assumes that British and American speakers engage different psycholinguistic processes when carrying out agreement, or engage processes that use different kinds of agreement-relevant information. For example, a British speaker contemplating a situation involving a series of Olympic events attended by large audiences of people might refer to ‘the crowd at the Olympic events’ and tacitly evaluate whether the individuals in the crowd or the group is more relevant. If the former, the speaker may be more likely to choose the plural-

agreement option offered for collectives in British English, saying 'The crowd at the Olympic events were….' In contrast, an American speaker may be more likely to disregard any latent variations in individuation and draw only on the singular specification for collectives that appears to hold in the American dialect. This would yield agreement patterns more along the lines of 'The crowd at the Olympic events was….'

To test this, Experiment 2 used a method very much like the one in the first experiment. The chief difference was that speakers received only the subject noun-phrases as preambles, with instructions to complete them to make full sentences. This meant that they created their own verbs. For verbs that carried number overtly (i.e., were not regular past-tense verbs), we assessed the number of the verb and its relationship to the grammatical and notional number variations in the preamble.

Other than the absence from the preambles of the verbs, the experimental and filler preambles were identical to those used in Experiment 1. An important implication is that the materials included a control for attraction, in order to be able to rule out spurious notional effects. If British speakers are indeed more likely to call on notional number variations when implementing verb agreement, we expected to observe increased use of plural verb agreement after collectives, relative to controls, in cases where distributive construals are most likely. As in Experiment 1, distributive construals were encouraged with subjects containing collective head and plural attractors (e.g. *The crowd at the Olympic events*). Relative to subjects with singular heads and plural attractors (e.g., *The spectator at the Olympic events*), where attraction should be the primary force promoting plural agreement, increases in plural agreement stemming from distributivity should be larger for British than for American speakers to the extent that British speakers use notional information in a way that the Americans do not. Although the results from

Experiment 1 and from the notional judgments suggest that British speakers are not generally more attentive to notional number variations, there may nonetheless be variations in the tacit use of notional number that are specific to verb agreement

4.2. METHOD. *Participants*. The participants were 192 individuals from the same sources as Experiment 1, meeting the same selection criteria. Half were British and half were American. None had participated in Experiment 1.

Materials. The materials were the same preambles used in Experiment 1, without the verbs. So, each item included only the six versions of the complex subject noun phrases shown in Table 5 and listed in Appendix C. Likewise, the filler preambles were the same, but stripped of their verbs. The construction of the lists was parallel to that of the lists used in Experiment 1.

Procedure. The only procedural change from Experiment 1 was that the participants were instructed simply to repeat and complete the preambles as sentences. Half the participants in each dialect group on each list received read-aloud presentation and the other half received reproduction presentation.

Scoring and data analyses. The responses on the experimental trials were transcribed and the grammatical number of the verbs produced in the sentence completions was scored. Verbs were classified as Plural or Singular only when the preamble was correctly reproduced, spoken just once, and the verb was unambiguously plural or singular. All other responses were assigned to one of two defective-response categories. The number-ambiguous category consisted of responses with verbs unspecified for number (most of these were regular past tense verbs, such as walked). Miscellaneous responses included incorrect preamble repetitions (generally, changes in the number of the head or attractor), completions that omitted a verb, and any other responses that fell outside of the categories described.

Application of these criteria resulted in 657 singular and 598 plural responses (19.0% and 17.3% of all responses, respectively), 1640 ambiguous responses (47.5%), and 561 miscellaneous responses (16.2%; 519 of these were incorrect preamble reproductions). The data were analyzed in the same way as in Experiment 1. Because the differences between read-aloud and reproduction presentation again had no impact on the theoretically important comparisons, we report inferential statistics only from a combined analysis of variance.

4.3. RESULTS. Table 11 displays the number of responses of each kind produced in each condition and Figure 4 highlights the key contrasts between British and American speakers in the production of singular and plural verbs. Considered by type of head noun, the results for British and American were the same for plural and singular head nouns. In both dialects, plural heads elicited plural verb agreement regardless of the number of the attractor. Singulars elicited predominantly singular agreement, but there was increased plural agreement when the attractor was plural, reflecting a typical attraction effect. When the head noun was collective, the results for the British and American speakers were noticeably different. With collectives, American speakers exhibited a large disparity in the use of plural verbs after singular and plural attractors. These results are consistent with the presence of attraction combined with distributive enhancement. By contrast, British speakers exhibited neither attraction nor distributive enhancement after collectives.

INSERT FIGURE 4 ABOUT HERE

INSERT TABLE 11 ABOUT HERE

Analyses of variance confirmed these effects statistically. There were significant effects of dialect, of the type of head noun, of the number of the attractor, and of the two-way interactions between the factors. All of these effects stemmed from the significant interaction

among dialect, head noun type, and attractor type (min F'(2,252)=6.22). This interaction reflects the differences in agreement and attraction between British and American speakers: With plural heads, the number of the attractor made no difference for either Americans or Britons; with singular head nouns, the number of the attractor created differences in attraction for both Americans and Britons, and with collective heads, the number of the attractor mattered only for the Americans.

4.4 DISCUSSION. Rather than revealing a hypothesized tendency among British speakers to use notional number in the implementation of verb agreement, the results gave the appearance that if anyone did, it was the Americans who used notional number. Given a subject noun phrase such as The audience at the tennis matches, British speakers were no more likely to produce plural verbs than after The audience at the tennis match. In both cases, the proportion of plural verb agreement was relatively high, roughly the same as the average proportion of plural pronouns that British as well as American speakers produced when the same phrases served as pronominal antecedents. Surprisingly, British speakers exhibited attraction across the board when they used pronouns and, if the head nouns were singular, when they used verbs, but there was no attraction for verbs when the heads were collectives.

In contrast, American speakers exhibited attraction in all of these conditions. Furthermore, with collectives, the magnitude of the difference in singular and plural verb usage after singular and plural attractors suggests that something more than simple attraction was at work. With singular head nouns, across all the verb and pronoun conditions, Americans averaged an increase in the use of plural number targets of approximately .16 after plural attractors, relative to singular attractors. With collective heads, the corresponding increase was a significantly larger .28. One interpretation of the increase is that the presence of the plural

attractor magnified the tendency to construe the referent of the collective as an aggregation rather than as a set, which raised the incidence of notionally driven plural agreement. This interpretation is supported by other results (Bock et al., 1999; Humphreys & Bock, in press). If it is right, the implication is that verb number agreement in the speech of Americans may be more likely to reflect variations in notional number than in the speech of Britons. For present purposes, this means that variations in how notional number is used are unlikely to explain the normal differences between the dialects in verb agreement with collective heads.

The key to a different explanation may be found in the absence of verb number attraction after collectives for the British speakers. This is a standard result when head nouns are grammatically plural. Because the use of plural verbs accompanying grammatically plural heads is all but categorical, it is usually impossible to tell whether attraction is absent or merely undetectable. One interpretation of the collective results for the British speakers is that it is genuinely absent. The reasoning goes like this: If collectives tend to be lexically specified as plurals among British speakers, attraction is unlikely to occur when a collective is the head noun because the plural number specification of the head noun reliably controls verb agreement. We tested this account in the third and fourth experiments.

5.0 EXPERIMENT 3: COLLECTIVE ATTRACTORS. If the psycholinguistic mechanisms of subject-verb number agreement are identical in British and American English, and if the construals of notional number for collectives are the same, the remaining hypothesis has to do with differences in lexical specification. This is hypothesis 3. British speakers may be more likely than Americans to specify collective words as plurals in the mental lexicon.

More precisely, there may be more grammatically plural collectives in British than in American English. So, very few collectives are reliably specified as plurals in standard American (people, cattle, and police may be the complete set); most other collectives are singular and unspecified for number. In British English, a larger minority of collectives may be conventionally plural, and therefore grammatically plural in the mental lexicons of speakers. A British speaker may use a plural verb after the word staff regardless of whether the speaker views the staff as an aggregation, simply because the word staff is plural. Because there is considerable variation over speakers as well as across collective and corporate nouns in the use of plural verb agreement in collective-noun contexts, a further consideration is that differences in experience with different collectives create individual differences in lexical specifications. Unlike morphologically alternating singulars and plurals, collectives carry no overt flag to number, suggesting that variable number specifications have to be learned on a case by case basis, or categorized by analogy to other collectives.

To test the hypothesis that the number specifications of collectives differ between the dialects, in Experiment 3 we examined attraction to collective, individual singular, and individual plural attractors. Recall that only grammatical number, the lexical specification of number, appears to attract verb or pronoun number. Previous work has shown that for American speakers, attraction does not occur with the same collectives that reliably elicit plural verb and pronoun agreement (Bock et al., 2004). Invariant plurals that differ in rated notional number (cf. the notionally singular scissors and the notionally plural suds; Bock et al., 2001) both yield significant amounts of attraction that do not differ in magnitude. In short, there is little evidence for attraction to notional number.

If collectives are more likely to be specified as grammatically plural in British than in American English, we should observe plural attraction to collectives among British speakers. Such attraction has been argued not to occur by den Dikken (2001), but observation suggests otherwise: A British speaker, a botanist presenting results from research on rape (the oil seed), pointed to a slide and said 'This field of oil seed rape are flowering.' One may quibble about whether *rape* in this sense is truly a collective, but for a botanist it is likely to alternate between singular and plural usages in the same way that collectives are supposed to (compare The rhododendron are blooming). Likewise, one may wonder if field is even remotely a collective, eliciting normal head agreement. To test the hypothesis more objectively, we employed a different tactic than in the previous experiments, necessitated by the low incidence of attraction among British speakers in general and the variable tendencies of collectives to be used as plurals in British English. We followed three steps.

First, from the corpora, we determined for each of the collectives employed whether it was plural dominant. Specifically, we examined how often each collective was accompanied by a plural verb when the collective served as the head of a subject noun phrase. When more than 90% of the corpus appearances of a given collective as the head of a subject noun phrase occurred with an unambiguously plural verb (out of all unambiguous singular and plural verb forms), we treated the collective as plural dominant, and likely to carry a plural specification.

Second, in Experiment 3, we measured the incidence of unambiguously singular and plural verbs after plural attractors, to obtain an estimate of the rate of plural attraction in each dialect under the specific circumstances of the experiment. The attraction rate was defined as the increase in the proportion of plural verbs relative to the proportion of plural verbs used after

singular attractors. Because any use of plural verbs after singular heads with singular attractors is unmotivated, given the materials employed, this proportion served as a control for chance.

Finally, given these empirically determined values, we calculated a predicted rate of plural attraction for each dialect and compared it to the obtained rate after collective attractors. The predicted probability was the product of the proportion of plural-dominant collectives in the sample multiplied by the observed probability of attraction after normal plurals. If collectives carry a plural lexical specification, the probability of collective plural attraction should be equal to the probability of normal plural attraction.

By design, none of the collectives employed as attractors met the criterion for plural specification in American English, so the predicted probability of plural attraction among American speakers was 0. For British speakers, 10 of the 36 collectives in Experiment 3 met the 90% criterion, so the predicted probability of attraction to collectives depended on determining how vulnerable the British speakers in the experiment were to attraction from normal plural nouns. We did that as follows.

5.1 METHOD. *Participants*. The British participants were 60 Cambridge University students from the same population as in previous experiments. An additional 30 participants were members of the MRC Applied Psychology Unit's volunteer participant panel, drawn from the Cambridge community. The Americans were 60 undergraduates at Michigan State University who received extra credit in introductory psychology courses in return for their service. British speakers were overrepresented in the sample to compensate for their very low rates of attraction, ensuring a more reliable estimate.

Equipment. British participants viewed the materials on a Zenith laptop computer running TSCOP (Norris, 1984) under DOS. Recordings were made with an AKG 1000 CS microphone

and Symetrix pre-amplifier onto a Marantz analog tape recorder. In the United States, materials were presented on the screen of a Macintosh 512K and recorded onto audio cassette tapes over a lapel microphone.

Materials. Preambles for the elicitation of verb agreement were developed on the model illustrated in Table 12. There were three versions of each of 36 experimental items. All versions of each item had the same head noun but different attractors. In the singular condition the attractor was a singular and in the plural condition the attractor was the corresponding plural. In the collective condition the attractor was a collective that was semantically related to the singular and plural, to promote the sensibility of the phrases. The collectives were chosen to have high plural-agreement values in British English, as shown in the norming tasks described earlier, and none of them elicited any plural agreement in American English. The rates of plural agreement in British English are shown in Appendix E.

INSERT TABLE 12 ABOUT HERE

The preambles were distributed over three lists so that every list contained only one version of every experimental item. An additional 56 items served as fillers, and were repeated on every list. The fillers consisted of simple noun phrases, all with definite determiners and a single noun or adjective-noun combination. Ten were singular and the remainder plural so that across each list, half of all items had normal plural morphology. The same random order of preambles was used in every list, with the order constrained so that eight fillers began the list, at least one filler separated all experimental items from their neighbors, and preambles representing the same experimental conditions never occurred as neighbors.

Procedure. Presentation was by the read-aloud method used in the previous experiments. Participants were seated in front of the computer and instructed to read the preambles aloud and

complete them as sentences as quickly as possible with the first thing that came to mind. They were also asked to speak as fast as possible. A single example was provided, using the noun phrase ‘The doctor’ and a sample completion ‘was examining the patient.’

The preambles were displayed in 14-point Courier font. On each trial the experimenter pressed a response button to reveal the preamble, and the preamble appeared 500 ms later. When the participant produced the last word of the preamble, the screen was cleared.

INSERT TABLE 13 ABOUT HERE

Scoring and data analyses. Scoring of the verbs was carried out as in the previous experiments. There were 4215 singulars (79.0% of all responses), 92 plurals (1.7%), 744 ambiguous (13.8%), and 305 miscellaneous (5.6%). The distribution of scores in all conditions is shown in Table 13.

5.2. RESULTS. Figure 5 displays the rates of plural attraction for British and American speakers. The attraction rate corresponds to the increase in the proportion of plural verbs after collective or plural attractors relative to the proportion of plural verbs used after singular attractors. Given (a) an overall attraction rate for British speakers of .018 after plural attractors and (b) a corpus-based estimate of .28 of the collectives having plural specification, the predicted rate of collective plural attraction in British English is .005. Figure 5 shows that that was precisely the value obtained.

INSERT FIGURE 5 ABOUT HERE

The rate of attraction for American speakers was .002. This exceeded the predicted value of 0, which was based on the absence from the experiment of any collectives that met the corpus criterion for plural specification in American English. However, as Table 13 reveals, .002 corresponds to exactly one more plural verb after collective than after singular attractors.

5.3. DISCUSSION. The attraction rate after plurals was almost five times larger for American than for British speakers, yet the rate after collectives was two-and-one-half times larger for the British than for the Americans. Though the absolute numbers are small, this reversal in the distribution of attraction supports the lexical specification hypothesis for collectives: British speakers treat certain collectives as plurals with respect to verb agreement because, lexically, the collectives carry a plural number specification.

COMPARATIVE RATES OF ATTRACTION. The rates of attraction in British English were lower than those in American English across all of the experiments. We examined two different explanations in an effort to explain the disparity. One hypothesis was that there are variations in the prescriptive training that lead to the avoidance of attraction. To compare how often British and American speakers identified attracted uses of verbs as acceptable, we administered a forced-choice grammaticality test to 96 speakers of American English and 30 speakers of British English. The speakers were drawn from the same populations as those tested in Experiment 3. The test consisted of eight pairs of sentences in which the members of each pair differed only in the number of the verb. For instance, one pair was

Carelessness in the use of tools causes many household accidents.

Carelessness in the use of tools cause many household accidents.

Half of the sentences had singular and half had plural subjects. Of the singulars, one had a simple noun-phrase subject and the other three had singular heads with plural attractors. Of the plurals, two had simple plural noun-phrase subjects and two had plural heads with singular attractors.

The pairs were printed in a list on a single page, and participants were asked to check or tick the correct member of each pair. To control for order effects, the order of the singular- and plural-verb versions and the order of the expected correct and incorrect versions were

counterbalanced across the pairs, and two different lists were used that varied only in the ordering of the pair members. The same materials and same lists were used for both dialects.

In both groups we examined the tendency to choose as correct the sentence from each pair whose verb mismatched the number of the head of the subject noun phrase. For British speakers the percentage of such choices was 9.2%; for American speakers it was 8.5%. The wide majority of these choices reflected plural attraction, 95.5% for British speakers and 93.8% for Americans. Clearly, the ability to recognize prescriptively correct agreement does not differ between the groups.

We also examined the possibility that British speakers responded more deliberately than the Americans, thereby reducing the likelihood of error. All of the singular and plural responses to all of the experimental items for the 120 university students in Experiment 3 (where the attraction rates were lowest for British speakers) were digitized and the durations of the responses were measured, along with the accompanying latencies from the pausing of the tape recorder (which was audible on the audio tapes) to the onset of speech on each trial. We focused on the latencies to speech, the durations of the subject noun phrases (the preambles), and the length of any pauses between the ends of the preambles and the onsets of the number-inflected verbs. These measurements revealed that British speakers actually responded more rapidly and spoke faster than the Americans, reaching the verb on average after 1.96 seconds compared to the Americans' 2.11 seconds (a difference that was significant by items, $\underline{F}_2(1,35) = 17.7$, but not participants $\underline{F}_1$ (2,118) = 1.98). Overall, however, the British and American speakers showed similar patterns of responding on all measures. In terms of the summary measure that includes time to reach the verb, both groups were fastest with singular attractors (1.91 and 2.07 seconds for the British and Americans respectively), slower with collectives (1.95 and 2.12 seconds) and

slowest with plurals (2.00 and 2.15 seconds). None of these differences were significant, and none of the other measures revealed divergent patterns.

One remaining possibility is that British speakers may be more likely to monitor their speech for attraction. If so, they may slow down selectively, lowering their speech rates primarily in the presence of potential agreement problems. To explore this, we correlated the time-to-verb measures for each item with the proportions of attraction for the same items in the condition with plural attractors. The correlations were performed separately for the British and American college students. For the British speakers, the correlation was modest but significant, r (36)=.33, $p < .05$, hinting at a tendency to speak slower on those items most likely to elicit attraction. For the Americans, there was no discernable relationship between speech rate and attraction, r (36)=-.02. This suggests that the source of the difference in vulnerability to attraction may be found in differential monitoring of speech.

6.0. EXPERIMENT 4: *PEOPLE*, *CATTLE*, AND *POLICE* IN AMERICAN ENGLISH. Because we intentionally omitted from Experiment 3 any collectives that American speakers reliably treat as plurals, we cannot yet claim with complete confidence that British and American speakers engage in the same basic linguistic operations when implementing agreement. If they do, Americans should also be susceptible to attraction from plural collectives. In Experiment 4 we tested this hypothesis on American speakers.

For this purpose we called on the miniscule inventory of collectives that most native speakers of American English know and treat categorically as plural. There are in fact only three of them, the collectives people, cattle, and police. These were used as attractors in the experimental items, along with five types of controls designed to explore other properties

potentially relevant to the occurrence of attraction. Among other things, the array of controls helped to ensure that the anticipated few cases of attraction after people, cattle, and police were not chance occurrences.

6.1. METHOD. *Participants*. The participants were 150 undergraduates at Michigan State University, all native speakers of American English. They received course credit or a small payment in return for their service in the experiment. None of them took part in any of the previous studies.

Materials. The experimental materials are listed in Table 14. There were only three items, each of which appeared in one of six versions. All versions of all items had singular head nouns followed by prepositional phrases, with the only differences among the versions occurring in the noun phrases within the prepositional phrases (i.e., in the attractors). The six types of attractors were uninflected collective plurals (e.g., people), simple singulars (e.g., individual), the corresponding plurals (e.g., individuals), collective singulars that are intuitively aggregations (e.g., society), collective singulars that are intuitively more group- or corporate-like (e.g., nation), and the plurals of the collective groups (e.g., nations).

INSERT TABLE 14 ABOUT HERE

Six lists were constructed such that (a) each contained one version of each of the three items; (b) the three item versions within a list represented the same types of attractors; and (c) across lists all versions of all items occurred once. Every list contained, in addition, 45 filler items analogous to the fillers used in Experiment 3. Of the 45 fillers, 24 were plural and 21 were singular. The same random arrangement of items was used in each list, constrained so that 18 fillers preceded the first experimental item and a minimum of 9 fillers separated the experimental items.

Procedure. The preambles were presented auditorily. The filler and experimental preambles were digitally recorded by a female speaker of American English and dubbed to analog tapes in the order predetermined for each list. During the experimental sessions, the experimenter played the preambles from a list one by one from a cassette tape recorder, pausing the tape as a signal for the participant to respond. The participants were instructed to repeat and complete each preamble as a sentence. Their responses were recorded and transcribed as before.

Scoring. The verbs produced in the responses were classified as in the previous experiments. A breakdown of the responses is shown in Table 15. The totals in each scoring category were 331 singulars (74.0%), 19 plurals (4.2%), 74 ambiguous (16.4%), and 26 miscellaneous (5.8%).

INSERT TABLE 15 ABOUT HERE

6.2. RESULTS. As in Experiment 3, we calculated the predicted probability of collective plural attraction based on the observed incidence of attraction in the Plural attractor condition. The rate of attraction in that condition was .065. If covertly plural-specified collectives create attraction at the same rate, we should observe the same incidence of attraction in the uninflected Collective plural condition. The actual rate was .052. The three errors of attraction that occurred were all after the collective people.

The only other condition in which plural attraction occurred was with inflected-plural collectives (e.g., nations). Reminiscent of other experiments in which plural collectives were used (Bock & Eberhard, 1993; Bock et al., 2004), these plurals elicited attraction at an unusually high rate (.22). None of the singulars, either collectives or simple count nouns, produced any attraction at all.

6.3. DISCUSSION. The results suggest that categorically plural collectives can create attraction among American speakers, and, just as for British speakers, that they do so at roughly the same rates as normally inflected count plurals. This provides the evidence that attraction occurs from categorically plural collective nouns for both British and American speakers.

We found attraction only for the collective people, and not at all for cattle or police. Given the very low rates of attraction, it is impossible to rule out chance absences in accounting for this, although other factors may be in play. The most likely is frequency: In word frequency counts, *people* occurs much more often than *police* and *cattle* (902 to 155 to 97 times per million words in the Brown corpus; Francis & Kucera, 1982). The frequency of invariable plurals increases their attractiveness (Eberhard et al., in press). Along related lines, the disproportionate amount of attraction to plural collectives (e.g., nations) can be attributed to the *relative* frequency of plural to singular forms for individual count nouns. Because of these factors, invariable plurals (e.g., scissors, suds) create significantly less attraction than their normally inflected counterparts (Bock et al., 2001), and rare plurals (nouns that very infrequently inflect with overt plural morphology, collectives included) trigger correspondingly *more* attraction (Bock et al., 2004). So, frequency and contrastiveness contribute jointly to the strength of attraction.

6.4. CONVERGING CORPUS ANALYSES. Although the rates of collective attraction in Experiments 3 and 4 are consistent with the hypothesis that the difference between British and American speakers is primarily one of grammatical number categorization, they were low enough to make converging evidence desirable. To strengthen the conclusion, we examined more closely the corpus distributions of plural verbs used with the collectives from our sample. Figure 6 shows the results for the collectives that occurred at least once as the subjects of verbs in the British and American corpora. The graph indicates the percentage range of plural verbs that

accompanied each collective when the collective headed the verb's subject. The incidence of plural verb use is given in 10% intervals between 0% and 100%. As before, percentages were calculated from the number of unambiguous plural verbs relative to the total of unambiguous singular and unambiguous plural verbs.

INSERT FIGURE 6 ABOUT HERE

For British collective usage, the figure reveals a bimodal distribution. More than two-thirds of the collectives (19) are either singular dominant or plural dominant, with the remainder in between. American usage, in contrast, is unsurprisingly singular dominant for 20 of the collectives. There is little difference between the dialects in the numbers of collectives occupying the intermediate ranges where lexically independent, notionally controlled usage might be reflected. However, the specific words that occur are not the same. Only *gang* and *majority* appear in the midranges for both dialects.

It might be argued that the distributions reflect some bias within our relatively small sample of collectives. Perhaps few of them are amenable to notional variation, either because of their semantics or their typical contexts of occurrence. To examine this, we also compared the distributions in the corpora for plural pronouns used with collective antecedents. Just as we did for the verb counts, we calculated the percentages of plural pronouns (out of all singulars and plurals) whose antecedents were unambiguously identifiable as one of the collectives in our sample. Figure 7 displays the results. Unlike the verbs, the uses of plural pronouns with collective antecedents are distributed relatively evenly across the full frequency range, for both British and American English. In terms of their pronominal anaphors, some collective antecedents are predominantly singular, some are predominantly plural, but the majority fall somewhere in between.

INSERT FIGURE 7 ABOUT HERE

6.5. THE PROBLEM OF ATTRIBUTIVES. A remaining objection to the lexical account of the dialect difference in collective verb-number agreement is that it predicts unattested dialectal variations in determiner agreement (what Corbett, 2000, called attributive agreement). Corbett (2000, p. 189; see also Sauerland & Elbourne, 2002) asserted that 'In attributive position…only singular is possible.' To prospect for these variations, we carried out an exploratory norming study in which 60 American and 74 British college students were asked to rate the acceptability of singular and plural demonstrative determiners (*this* or *these*) combined with specific collectives (including all of those used in the present experiment) and other singular and plural nouns. The ratings were done on a five-point scale ranging from 1 (completely acceptable) to 5 (completely unacceptable). For most of the collectives, the differences were negligible: Both British and American speakers found phrases such as *these crowd* to be highly unacceptable (mean ratings of 4.9 and 4.6, respectively), whereas *these clergy* was comparatively acceptable to both groups (mean ratings of 1.6 and 1.5, respectively). Overall, the American and British judgments differed by an average of just .2, a fifth of a scale point.

In a few cases, however, the judgments diverged sharply. *These staff, these jury*, and *these crew* were fairly acceptable to the British raters (with an average rating of 2.9 compared to the Americans' 4.0), and *these staff* was actually rated as more acceptable than *this staff* (1.8 vs. 2.1). In contrast, *these faculty* was relatively acceptable to the Americans (2.8) but decidedly not to the British (4.5). So, consistent with our other results, it appears that a few superficially singular collectives carry covert plural specifications that allow them to occur even with plural determiners, and that this is indeed more likely for British than for American speakers.

7.0. General Discussion

Graduate students of a certain vintage in psychology were heavily schooled to treat the word data as plural. The singular datum being virtually obsolete, the natural, unschooled inclination is to treat data as a mass noun, therefore singular. So, the traditional training imposed plural verb use on a natively singular noun, one with the conceptual features normally associated with mass nouns. If successful, the product of this training would be a conceptually unsupported, lexically controlled plural specification for data, with effects that serve to illustrate our hypothesis about the lexical source of the differences between collective agreement in British and American English.

Observations of data attraction and agreement among well-trained speakers of the plural-data dialect suggest that these speakers indeed have a plural lexical specification for data:

The collection of the data were...

I think that the interpretation of the data are controversial,

I'm not quite sure what the status of these pieces of data are.

The great thing about these data are...

The last bit of data we collected were on…

The data itself are okay, you know?

The last example, produced by one of the authors, is revealing. The verb is plural, in line with professional convention, but the logophoric reflexive is singular, in line with the stubborn, ineradicable mass construal of the normal referent of data. A similar clash between verb and pronoun number was shown in example 7 (repeated below) in a British speaker's use of a corporate noun:

(7) It's clear that this is the reaction of an embattled Tory party that *believe it's* going to lose.

Our results for British and American collective agreement suggest that lexically controlled features are responsible for the differences in plural agreement between the dialects. In spontaneous speaking, specifications of plurality for particular collectives and not dynamic variations in underlying conceptualization create the differences. This is consistent with the third of the three hypotheses we tested, the one that attributes the differences between the dialects to differences in lexically specified number among collective nouns. The lexicons of individual speakers of a dialect may differ in which collectives are specified as plural, for reasons that may be traced to differences in linguistic experience. Across speakers, there will be variability in which collectives are treated as plurals, but lexical rather than notional variability drives the patterns of usage that we found in both experimental elicitation and corpus distribution.

A review of the evidence in terms of the three hypotheses that we tested may help to clarify these conclusions. We began with two versions of the traditional account of British collective subject-verb number agreement, whereby British speakers call on differences in perceived or conceived collective number while Americans do not. On the first version of the hypothesis, the difference is in conceptualization alone, with Americans conceiving of collectives uniformly (with few exceptions) as singulars. The results of personal pronoun usage in the two dialects argued against this account, inasmuch as British and American speakers displayed the same, substantial amount of variability in the use of plural pronouns with collective antecedents.

The second hypothesis, a stronger version of the traditional account, attributed greater notional control of number variability to British speakers and greater lexical control to American

speakers. Counter to this, we observed little inclination on the part of British speakers to change verb number in accord with variations in the distributivity of subject noun phrases; indeed, judging from variations in the use of plural verbs after distributive subjects, American speakers tended to be more sensitive than the British to the possibility of distributive construals.

The third hypothesis was evaluated in a different experimental test, which considered whether British speakers are more likely than Americans to treat collectives as grammaticized plurals. Consistent with evidence that attraction occurs in response to the lexical number specifications of attractors rather than notional number, the results of Experiment 3 showed that British speakers were more likely than Americans to exhibit attraction to collective local nouns, to a degree precisely in line with the lexical statistics for collective plural agreement. Experiment 4 revealed a similar tendency among American speakers for those collectives that are invariably plural in American English. With respect to verb agreement, corpus data revealed a bimodal distribution of singular and plural collectives in British English but a unimodal distribution in American English. With respect to pronoun agreement, the same collectives in both dialects covered a uniform range of singular and plural agreement. Finally, normative ratings of phrases coupling singular and plural determiners (attributives) with collectives also revealed differences between the dialects consistent with the lexical account.

From a psycholinguistic perspective, the results favor a view in which the basic grammatical and processing mechanisms of American and British English are the same, with the source of the dialectal variations being a relatively minor difference in conventional lexical number specifications. Some British prescriptions likewise point to lexical rather than conceptual convention: As noted in the introduction, the prescription of BBC Radio News is that collectives should be plural, but BBC Online says (or say, as BBC Radio would have it) they should be

singular. Consistent with the traditional explanation of collective variability, the BBC Styleguide (Allen, 2004) recommends thinking about whether an organization is 'seen as a singular entity or as a collection of individuals' (p. 31). The difficulty for speakers is that such thinking demands much more time than most occasions of spontaneous speech allow. Obviously, speakers (as well as writers) *can* cogitate about such matters; we are not saying that this never occurs. Our claim is simply that stored lexical specifications are more likely to control agreement for most speakers most of the time, and that variability in specification is a more likely source of dialect variability than variability in thinking or in the processes of agreement themselves.

This is inconsistent with existing accounts of the nature of the difference between American and British collective agreement. There is nothing in our data to suggest that British speakers are more alert than American speakers to the notional-number possibilities implicit in number-ambiguous circumstances or that British speakers implement agreement differently, using different number features. Apart from plural verb agreement with collective-headed subject noun phrases, the only thing that set British speakers apart was their greater resistance to attraction from plural local nouns. Consistent with this resistance was a tendency among British speakers to speak more slowly in regions with plural attractors prior to verb onset. The implication is that the avoidance of attraction is a consequence of monitoring one's speech (Hartsuiker & Kolk, 2001) and not a consequence of the basic mechanisms of agreement implementation.

Apart from this, a complete account of collective agreement in British English must include a productive subcategory of corporate nouns. It is not only existing collectives that take plural agreement. The names of agencies, corporations, teams, and the like take plural agreement, even when the agencies are completely fictional (e.g., the Ministry of Magic). In the

same way that new members of the category of leg-encasing garments tend to become overtly plural in English (cf. the pedalpushers and clamdiggers of the 1950s American wardrobe), in British English new members of the corporate category may be treated as covert plurals for the purpose of verb agreement. The only contrast with American speakers has to do with verb agreement (and perhaps attributive agreement for some words), since in pronoun agreement, collectives tend to be treated as plural in both dialects. It is in the classification processes that create lexical subcategories where we see conceptual number (or a Mereology feature; Sauerland & Elbourne, 2002) playing a part.

For linguistic theories of agreement, our findings point to mechanisms that operate differently for verbs than for pronouns. English verb agreement works in ways that suggest directional control in the determination of number features, in line with derivational accounts of syntax. English pronoun agreement instead reflects concord in notional or referential indices, as suggested by constraint satisfaction theories. The similarities between verbs and pronoun in their vulnerability to attraction, and the strong evidence for directional structural involvement of lexical specifications, imply that there are mentally represented linguistic structures in which verb and pronoun agreement are treated equivalently. In these domains, a unified treatment of verb and pronoun agreement seems feasible for accounts that take the phenomena of attraction as linguistically relevant (as in den Dikken, 2001).

The results for pronoun agreement in Experiment 1 are problematic for Binding Theory (Chomsky, 1981). The similarities in the data for reflexive and tag pronoun number suggest that the forms and distributions of pronouns are not well correlated with the distributions of agreement features: Both reflexive pronouns and tag pronouns tended to be plural after singular collective antecedents, and to the same degree. Both also tended to undergo attraction to

grammatical plurals, to the same degree. At a minimum, the implication is that the agreement features of pronouns are not subject to the same constraints as the selection of their lexical or morphological forms (e.g. the use of the *-self* suffix).

Our account of the results, and our explanation of the difference between British and American agreement, is couched in terms of a psycholinguistic theory that incorporates mechanisms often posed as competitors rather than compatriots in other theories. Explaining the variability in English subject-verb number agreement demands semantic modulation of a strongly structural or abstract syntactic process; explaining the variability in English pronoun number agreement demands abstract structural modulation of a strongly semantic process. To account for the variability that they share, most obviously in attraction but also in agreement, requires an account of how structural and semantic processes work together. Accordingly, our processing approach to verb and pronoun agreement includes semantically driven lexical retrieval mechanisms and notionally sensitive structural annotations, similar to elements of constraint satisfaction. These processes drive the creation of linguistic representations for sentence production and the interpretation of representations in comprehension. In addition, our approach includes mechanisms of structural manipulation that are isolable from (and capable of independent operation in the absence of) conceptual input, similar to elements of more formal or derivational approaches in linguistics.

To anticipate a few of the objections to our results and our interpretation of them, we close with a look at some of the weaknesses in what we have done and some of the most pressing questions that remain open. The dialectal differences we examined are filtered through idiolects, and the idiolects of our speakers may not well represent the norms of the dialects in question. All of the speakers were young adults. Almost all of the British speakers represent a privileged elite,

attending exclusive colleges at one of the most exclusive universities in Great Britain. This clearly makes them unrepresentative, but for our purposes they provide a very good test of how well the most intelligent and well-educated speakers of British English realize the number distinctions that separate British from American English. To wit: If Cambridge are insensitive to the nuances of number, chances are good that most other British speakers are, too.

We recognize the artificiality of sentence completion tasks and the concern that the resulting data may lack validity with respect to the issues we addressed. However, previous work has shown that the tasks elicit responses with properties similar to utterances that occur in spontaneous speech, in particular with respect to the distribution of attraction (Bock & Miller, 1991), and many of the results we report have been replicated repeatedly. The tasks reveal reliable, linguistically principled effects of semantic (Eberhard, 1999; Humphreys & Bock, in press; Vigliocco & Hartsuiker, 2002), structural (Bock & Cutting, 1992; Franck, Vigliocco, & Nicol, 2002; Vigliocco & Nicol, 1998) and morphological (Hartsuiker, Schriefers, Bock, & Kikstra, 2003) variations on agreement. More generally, psycholinguistic research on speech errors has shown that laboratory tasks elicit the same kinds of variability as are evident in corpora of spontaneous speech (Garrett, 1982; Stemberger, 1992). The results are nonetheless open to challenge from future observations; they serve as just one set of tests of the hypotheses we set out in the introduction and many others are possible.

Among other possible tests there are not only different tasks and different contexts of evaluation, but different comparison conditions, different agreement controllers, and different agreement targets. The scope of our work (two dialects, three types of agreement targets, two task variations) demanded that we limit the number of variations in agreement controllers and contexts and the diversity of the items that we tested. More deliberate selections of collective

nouns are especially desirable, and we hope our results will motivate others to pursue these kinds of variations in detail.

In the psycholinguistic literature, a repeated objection to sentence completion tasks is that they tap comprehension as well as production. For theories that aim to explain one or the other but not both, this is indeed a drawback. However, because parallel results have been reported for agreement processes in tasks that emphasize comprehension over production (Nicol, Forster, & Veres, 1997; Pearlmutter, Garnsey, & Bock, 1999), we are optimistic that in time, a relatively unified processing account may explain both the comprehension and the production of agreement in much the same terms.

So, we have reported evidence for a psycholinguistic account of number agreement that makes sense of the differences between British and American English. The explanation is different from traditional views of these differences, emphasizing lexical factors over conceptual and notional ones. The bridges from this account to competing linguistic approaches suggest that there is psycholinguistic merit in both constraint satisfaction and derivational explanations of agreement processes, and that mechanisms reminiscent of the principles of both accounts play important parts in normal language processing.

8.0 SUMMARY. Combining experimental, corpus, and normative data, the results suggest that one of the most striking syntactic differences between British and American English is not necessarily attributable to greater sensitivity to number nuances on the part of British speakers, nor to undue abandon on the part of American speakers. Speakers of both dialects appear to implement number agreement in very similar ways, with only differences in the lexical-number specifications of collectives serving to distinguish them.

The results support an account of English number agreement that unifies the psycholinguistic mechanisms behind the realization of verb and pronoun number. The major source of number information for both is in the messages of speakers; both undergo number reconciliation processes within linguistic structural representations. The major difference in number agreement between verbs and pronouns, according to the present account, is that pronouns display concord in number with their antecedents whereas verbs acquire number only under structural syntactic control from their subjects.

*Author Note

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Appendix A: *Nouns used in spoken-completion norms*

Collective	Noncollective singular	Noncollective plural
academy	scholar	scholars
administration	administrator	administrators
agency	agent	agents
army	soldier	soldiers
assembly	student	students
association	associate	associates
audience	spectator	spectators
band	drummer	drummers
battalion	leader	leaders
brigade	general	generals
brood	hen	hens
brothel	prostitute	prostitutes
bureaucracy	bureaucrat	bureaucrats
cartel	dealer	dealers
cast	actor	actors
cavalry	rider	riders

choir	singer	singers
clan	relative	relatives
class	pupil	pupils
clergy	bishop	bishops
clientele	client	clients
clique	friend	friends
club	member	members
coalition	ally	allies
cohort	comrade	comrades
college	teacher	teachers
colony	pilgrim	pilgrims
committee	chairperson	chairpersons
commune	companion	companions
community	inhabitant	inhabitants
company	employee	employees
congregation	worshipper	worshippers
convent	nun	nuns
corporation	executive	executives
council	councilor	councilors
county	commissioner	commissioners
crew	sailor	sailors
crowd	protestor	protestor
democracy	legislator	legislators

establishment	chief	chiefs
faction	supporter	supporters
faculty	professor	professors
family	parent	parents
federation	partner	partners
fellowship	follower	followers
fleet	mariner	mariners
flock	bird	birds
fraternity	boy	boys
gang	delinquent	delinquents
gentry	aristocrat	aristocrats
government	governor	governors
group	individual	individuals
guild	assistant	assistants
harem	concubine	concubines
herd	cow	cows
institution	affiliate	affiliates
jury	judge	judges
kin	cousin	cousins
league	confederate	confederates
litter	kitten	kittens
majority	constituent	constituents
military	commander	commanders

militia	guard	guards
minority	voter	voters
mob	rioter	rioters
monastery	monk	monks
navy	captain	captains
neighborhood	neighbor	neighbors
nobility	king	kings
orchestra	musician	musicians
pack	dog	dogs
parish	parishioner	parishioners
parliament	politician	politicians
party	guest	guests
platoon	warrior	warriors
populace	resident	residents
posse	deputy	deputies
prison	prisoner	prisoners
public	citizen	citizens
regiment	fighter	fighters
royalty	queen	queens
school	principal	principals
senate	senator	senators
settlement	settler	settlers
society	civilian	civilians

sorority	girl	girls
squad	officer	officers
staff	worker	workers
swarm	bee	bees
team	player	players
town	mayor	mayors
tribe	indian	indians
troop	trooper	troopers
union	manager	managers
university	dean	deans
village	peasant	peasants

Appendix B: Collective Nouns Normed from Corpora

Numbers of Tokens of Unambiguous Singular or Plural Agreement Targets from Corpus Counts

	Verbs		Pronouns	
	American	British	American	British
Collectives				
agency	104	19	10	34
army	9	22	1	42
audience	23		0	
band	6	5	3	8
brigade	1	2	0	4
cast	5	1	2	4
choir	0	0	0	0
clan	2	0	0	1
class	5	5	2	12
clergy	1	1	5	3
club	6	16	0	37
colony	3	8	16	3
committee	52	27	11	43

couple	19	23	2	11
crew	2	9	2	11
crowd	8	5	3	6
delegation	6	4	3	4
faculty	2	17	1	29
family	33	11	0	17
fleet	2	5	1	14
gang	2	3	0	7
group	301	28	111	46
guild	0	3	0	6
herd	0	1	0	4
jury	23	1	3	8
majority	15	7	8	15
mob	0	0	0	1
quartet	0	0	0	1
service	49	2	0	5
squad	0	4	0	4
staff	29	14	8	37
team	28	21	7	41
troop (troupe)	2	0	0	0
university	11	2	3	15

Appendix C: Materials for Experiments 1 and 2

Head noun phrase: Collective/ singular(plural)	Prepositional postmodifying phrase: Singular(plural) attractor	Reflexive/Tag Pronoun-eliciting verbs (Experiment 1 only)
The gang/ gang leader(s)	with the dangerous rival(s)	armed/vanished
The jury/judge(s)	for the trial(s)	disqualified/deliberated
The committee/ representative(s)	from the union(s)	defended/voted
The majority/ politician(s)	at the meeting(s)	represented/prevailed
The herd/elephant(s)	near the waterfall(s)	cleaned/grazed
The protest group/ protester(s)	behind the fence(s)	entertained/chanted
The mob/student(s)	outside the state building(s)	handcuffed/picketed
The army/soldier(s)	with the easygoing commander(s)	indulged/relaxed
The clan/relative(s)	of the Scottish monarch(s)	introduced/disappeared
The choir/singer(s)	for the church service(s)	dressed/practiced

The university/ driver(s)	with the warning(s)	reformed/reformed
The audience/ spectator(s)	at the tennis match(es)	behaved/shouted
The team/player(s)	in the advertisement(s)	disgraced/sprinted
The fleet/ship(s)	with the distinctive flag(s)	betrayed/surrendered
The class/pupil(s)	in the writing competition(s)	prepared/improved
The dance troupe/ dancer(s)	under the bright light(s)	presented/complained
The cast/actor(s)	in the soap opera(s)	watched/rehearsed
The crew/sailor(s)	with the peacekeeping force(s)	fooled/caroused
The faculty/ professor(s)	with the research award(s)	prided/persevered
The fire brigade/ fire-fighter(s)	outside the building(s)	distinguished/rested
The police/ officer(s)	with the security company(ies)	protected/gambled
The student club/ debutante(s)	in charge of the party(ies)	allowed/gossiped
The crowd/ competitor(s)	at the Olympic event(s)	enjoyed/waited
The cleaning agency/cleaning lady(ies)	for the clinic(s)	outdid/arrived

The actors' guild/ famous actress(es)	in charge of the charity benefit(s)	embarrassed/celebrated
The delegation/ director(s)	from the wealthy foundation(s)	exempted/departed
The clergy/priest(s)	from the rural church(es)	absolved/prayed
The couple/widow(s)	with the trust fund(s)	consoled/retired
The boy scout troop/ young boy scout(s)	at the campground(s)	warmed/misbehaved
The rock band/ band leader(s)	with the powerful amplifier(s)	deafened/strutted
The secret service/ secret agent(s)	from the foreign country(ies)	hid/blundered
The jazz quartet/ jazz player(s)	at the nightclub(s)	promoted/improvised
The family/tourist(s)	with the expensive camera(s)	photographed/posed
The staff/secretary(ies)	for the training program(s)	asserted/quit
The nudist colony/ nudist(s)	near the sand dune(s)	concealed/sunbathed
The camera crew/ photographer(s)	from the local station(s)	endangered/hurried

Appendix D: *Inferential statistics from Experiments 1 and 2*

	By participants		By items		min F'	
Source of variance	Degrees of freedom	$\underline{F}_1$ value	Degrees of freedom	$\underline{F}_2$ value	Degrees of freedom	$\underline{F}$ value
			Experiment 1: Tag and reflexive pronouns			
Dialect	1,380	2.1	1,35	1.0	1,75	.7
Pronoun type	1,380	3.3	1,35	.6	1,49	.5
Head noun type	2,760	230.9	2,70	746.1	2,686	157.9*
Attractor number	1,380	134.7	1,35	69.7	1,79	46.0*
Dialect x pronoun type	1,380	.5	1,35	.8	1,191	.3
Dialect x head noun type	2,760	6.1	2,70	4.5	2,202	2.6
Dialect x attractor number	1,380	3.6	1,35	5.3	1,177	2.2
Pronoun type x head noun type	2,760	.4	2,70	1.1	2,580	.3

Pronoun type x attractor number	1,380	3.9	1,35	11.4	1,300	2.9
Head noun type x attractor number	2,760	13.5	2,70	3.9	2,115	3.0
Dialect x pronoun type x head noun type	2,760	.2	2,70	1.1	2,781	.2
Dialect x pronoun type x attractor number	1,380	5.0	1,35	1.5	1,59	1.2
Dialect x head noun type x attractor number	2,760	2.3	2,70	.6	2,111	.5
Pronoun type x head noun type x attractor number	2,760	2.4	2,70	5.6	2,518	1.7
Dialect x pronoun type x head noun type x attractor number	2,760	1.4	2,70	.1	2,80	.1
			Experiment 2: Verbs			
Dialect	1,188	15.8	1,35	16.6	1,122	8.1*
Head noun type	2,376	189.5	2,70	551.7	2,415	141.1*
Attractor number	1,188	22.6	1,35	20.7	1,111	10.8*
Dialect x head noun type	2,376	30.8	2,70	19.6	2,174	12.0*
Dialect x attractor	1,188	16.9	1,35	30.4	1,171	10.9*

number						
Head noun type x attractor number	2,376	7.9	2,70	6.0	2,196	3.4*
Dialect x head noun type x attractor number	2,376	11.9	2,70	13.1	2,252	6.2*

**min F'* significant at $p < .05$

Appendix E: *Materials for Experiment 3*

Preamble onset	Collective/Plural/Singular Attractors	British norm value*
The job of the night	staff/workers/worker	(.796)
The boat waiting for the	crew/sailor/sailors	(.692)
The attitude of the	military/commanders/commander	(.538)
The prayer offered up by the	congregation/worshippers/worshipper	(.154)
The daily routine of the	militia/guards/guard	(.231)
The good reputation of the	fraternity/boys/boy	(.308)
The nest intended for the	brood/hens/hen	(.273)
The strategy conceived by the	battalion/leaders/leader	(.231)
The trophy for the best	team/players/player	(.308)
The opinion of the	populace/residents/resident	(.385)
The dance of the Navajo	tribe/Indians/Indian	(.083)
The slogan chanted by the	mob/rioters/rioter	(.231)
The announcement made to the	assembly/students/student	(.231)
The clear duty of the	public/citizens/citizen	(.385)
The owner of the	herd/cows/cow	(.154)
The impressive title of the	guild/assistants/assistant	(.154)

The courage of the	platoon/warriors/warrior	(.231)
The rumor [rumour] about Mary's	clique/friends/friend	(.385)
The decision of the	jury/judges/judge	(.333)
The territory defended by the	pack/dogs/dog	(.154)
The recommendation of the city	council/councilors/councilor	(.154)
The sudden attack by the	swarm/bees/bee	(.385)
The punishment of the rebellious	squad/officers/officer	(.308)
The barricade evaded by the	crowd/protestors/protestor	(.308)
The brilliant performance by the	cast/actors/actor	(.154)
The future of the Russian	brigade/generals/general	(.333)
The triumph of the	navy/captains/captain	(.154)
The illegal profit of the	cartel/dealers/dealer	(.250)
The dress uniform of the	army/soldiers/soldier	(.231)
The speech prepared for the	parliament/politician/politicians	(.231)
The defeat of the	regiment/fighters/fighter	(.077)
The policy of the	government/governors/governor	(.250)
The concert by the young	orchestra/musicians/musician	(.231)
The immediate destination of the	fleet/mariners/mariner	(.231)
The rhythm of the	band/drummers/drummer	(.154)
The gift for David's	family/parents/parent	(.154)

*The British norm value is the proportion plural verb agreement for the collective noun, as measured in the Cambridge-British norming. The corresponding American value was 0 in all cases.

Table 1: *Observed instances of apparent plural attraction*

Considering what the function of humorous statements are in conversation…
At first, membership in these unions were voluntary…
Good grammar that is favorable to listeners are often associated with people from an upper class.
I don't think it much matters where the final re-interment of these men are.
I'm not sure how meaningful the idea of pronunciation rules are.
..what the system controlling the eyes are doing..
The quality of the talks were uniformly high.
How much correction of syntactic errors are there, anyway?
..the distribution of clean needles and condoms are the solution..
Closing these gaps are a priority for NIMH.
..the breaking of relations in themselves..