

Of *old couples* and *important committees*

Accessing members of groups using modifiers

Curt Anderson*

Heinrich-Heine-Universität Düsseldorf, SFB 991

andersc@hhu.de

Previous work in the semantics of group nouns has shown that different terms for groups profile their members to different degrees. However, little work has attempted to capture this difference in modification. I argue that the difference is conceptual (rather than grammatical) in nature, and propose that the circumstances surrounding the creation of the group is to blame; some groups are created via social acts of creation, while others are constructed via consideration of social circumstances. This is cashed out in a variant of Düsseldorf frame semantics.

1 Introduction

Group nouns (sometimes called committee nouns or collection nouns) are nouns that denote groups of individuals, such as *committee*, *couple*, *family* and *organization*.¹ Adjectival modification of group nouns such as *committee*, *family*, and *couple* show that group nouns have a complex lexical semantics; modification shows that groups differ in the accessibility of members within the group, as in (1), as well as in whether an adjective targets a property of the group members or the group itself (see (2)). Additionally, attributions can be made about the group without the property being ascribed to the members of the group, like in (3).

- | | | |
|-----|--|------------------------|
| (1) | a. ??The blonde committee is standing in the corner. | (members inaccessible) |
| | b. The blonde couple is standing in the corner. | (members accessible) |
| (2) | a. an old family | (=age of group) |
| | b. an old couple | (=age of members) |
| (3) | a. an old family with a lot of young parents | |
| | b. an unimportant committee headed by important senators | |

* This research was funded by DFG SFB 991 “The structure of representations in language, cognition, and science,” project C10.

¹ Sometimes nouns such as *pile* (*pile of cards*) and *bunch* (*bunch of flowers*) are included in this family of nouns. I explicitly set aside discussion of these nouns.

We pursue an analysis of group nouns that can adequately capture these facts, using notions of social acts and individuals, a move recently made by Anderson & Löbner (to appear) in the discussion of social roles such as *president*. Our account makes crucial use of frames (Petersen, 2007; Kallmeyer & Osswald, 2014; Löbner, 2014, a.o.) to capture the lexical semantics of these nouns. We show how different group nouns differ in their conceptual structure and modification potential.

2 Accessibility of members

The empirical point we pursue in our discussion is that group nouns differ in how accessible their members are. Joosten et al. (2007) provides initial observations regarding this, showing in Dutch that some group nouns conceptually profile their members to a higher degree than others. They show that group nouns such as those in (4) abstract away from their members to a high degree, while others such as those in (5) allow easier access to the members.

(4) committee, association, club, company

(5) couple, pair, family, team

The accessibility of members of different groups can be seen with modifiers that strongly prefer individuals such as *blonde*. Modifiers such as this are much more easily interpretable with groups that profile their members compared to this that do not.

- (6) a. a blonde couple
b. ??a blonde committee

Corpus data backs up the intuition that members of these groups are accessible to different degrees. For a set of group-denoting nominals based partially on Joosten et al.'s (2007) list of group nouns,² we extracted from the British National Corpus A+N pairs, ignoring pairs with operator adjectives (*former*, *possible*) and relational adjectives, as well as determiners and numerals tagged as adjectives in the BNC. A total of 995 pairs were tagged for whether they targeted an attribute of the group (*important committee*) or the members of the group (*blonde couple*). Figure 1 shows these results.

This initial corpus work suggests that there is no *categorical* difference at work between different groups terms. If there were a categorical difference, we would expect an S-shaped distribution, with some A+N combinations being attributions related to the group, others being attributions of the members, and little in between. Rather, what we find is that there is a gradient between groups that easily allow access to their members versus groups that do not allow easy access to their members. Therefore, we consider the difference between the semantics of group nouns, at least along the dimension of member accessibility, to be a conceptual rather than grammatical difference. As a shorthand to talk about the extremes on this scale, we will preserve talk of *committee*-type groups and *couple*-type groups, in order to distinguish between groups that either do not easily allow or do easily allow access to their group members, respectively.

3 Frames and social ontology

The formalization is based on Düsseldorf frames (Kallmeyer & Osswald, 2014; Löbner, 2014; Petersen, 2007). The basic idea of Düsseldorf frames is grounded in the work of Barsalou

² Our nouns were *couple*, *public*, *family*, *staff*, *trio*, *pair*, *congregation*, *gang*, *household*, *duo*, *choir*, *jury*, *crew*, *team*, *class*, *party*, *army*, *panel*, *orchestra*, *club*, *delegation*, *committee*, *organization*, *union*, *government*, *firm*, *company*, *association*, and *tribe*.

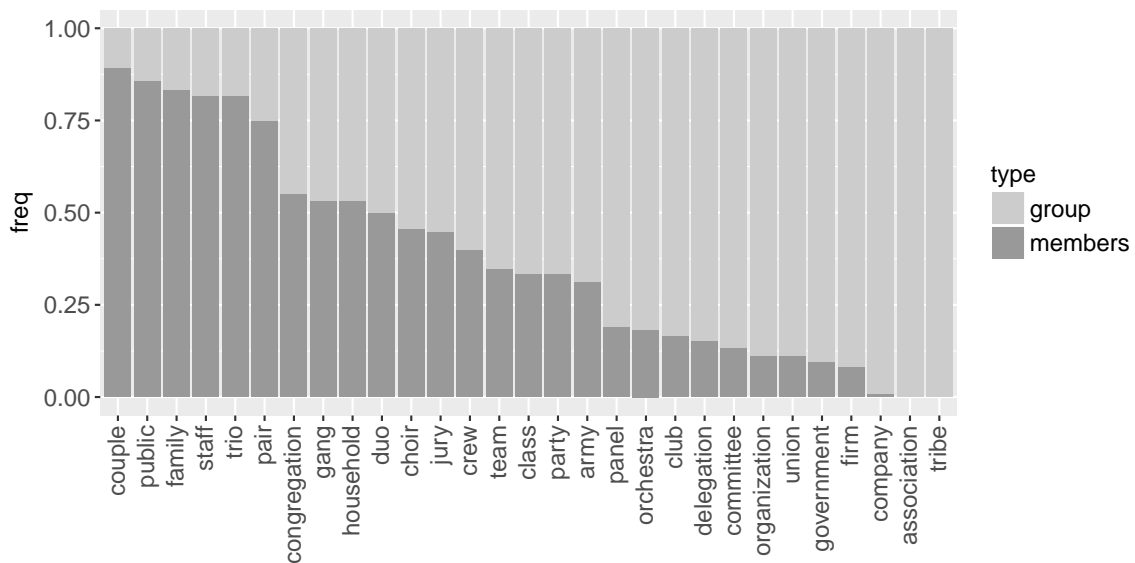


Figure 1: Frequency (for group nouns) of whether selected attributive adjectives specify attributes of the group or its members

(1992), who argued that mental representations are represented via frames, complex symbolic feature structures. Düsseldorf frames are a formalization of Barsalou frames as attribute–value structures, familiar from work in linguistics. Attributes are represented as functions, mapping the possessor of the attribute to a value. Values are typed via typed feature structures (Carpenter, 1992). Frames are recursive in that values may also have attributes.

Building on the usual frame ontology of individuals, times, and events (see e.g. Löbner 2017), we assume a rich, multisorted ontology containing both social and non-social entities. Following Anderson & Löbner (to appear), we assume mappings between these domains: a time-dependent mapping IMPL (implementation) from social individuals (x_s, y_s, \dots) to concrete (non-social) individuals (x_o, y_o, \dots) ,³ and a relation C-CONST (constitution under circumstances) between concrete individuals and social individuals. C-CONST encodes Searle’s (1995) notion of “collective intentionality,” whereby certain individuals count as a social object in a certain context (e.g., particular pieces of green paper in the United States count as money). Concrete individuals and events represent brute facts in the sense of Searle (1995), the physical manifestations that social concepts are grounded in. Moreover, social individuals generated through collective intentionality (and here, C-CONST) have an asymmetric existence, requiring that there exist concrete/personal level individuals to physically implement the social individual.

The figure in Figure 2 diagrams this relationship between domains, with arrows representing mappings from one domain to another. θ represents a thematic mapping between an event participant and an individual (e.g., the familiar notions such as THEME and AGENT). IMPL and C-CONST are defined as in (7) and (8), following Anderson & Löbner (to appear).

$$(7) \quad \text{IMPL}_t(x_s) \stackrel{\text{def}}{=} \iota x_o. x_o \text{ implements the social individual } x_s \text{ at time } t$$

$$(8) \quad \text{C-CONST}_c(x, y) \stackrel{\text{def}}{=} \text{under circumstances } c, x \text{ counts as } y$$

Social events and individuals can thus be values of frames, and therefore have attributes that

³ We depart from Anderson & Löbner (to appear) and use IMPL for both the individual and event mapping. The distinction is not crucial here.

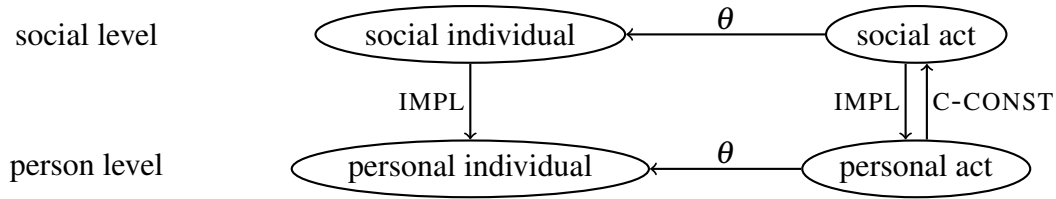


Figure 2: Diagram of social ontology and mappings between ontological sorts

correspond to them. Moreover, the ontology assumptions laid out here distinguish the group as a social object from its members; IMPL maps groups to the individuals implementing the group at some time, but does not equate the group with the members of the group.

4 Semantics of group nouns

We take all group nouns to have as their referent an atomic social object corresponding to the group, an individual from the domain of social individuals. Therefore, nouns at both ends of the scale, *committee*-type and *couple*-type, both refer to objects of the same type. Being social individuals, these individuals must be grounded by concrete individuals at the personal level of the ontology. Therefore, all group nouns have a IMPL attribute that maps the group to its members. We take the value of the IMPL attribute to be mereological sum of the individuals corresponding to the members of the committee. The logical forms in (9) represent tentative frames for *committee*- and *couple*-type groups.

- (9) a. $\llbracket \textit{committee} \rrbracket = \lambda x_s \exists x_o [\mathbf{committee}(x_s) \wedge \text{IMPL}(x_s) = x_o \wedge \dots]$ (tentative)
 b. $\llbracket \textit{couple} \rrbracket = \lambda x_s \exists x_o [\mathbf{couple}(x_s) \wedge \text{IMPL}(x_s) = x_o \wedge \dots]$ (tentative)

Social-level events have thematic relations to event participants. Social-level individuals (groups, in this case) can be participants in these events.

- (10) a. The committee decided against the proposal.
 b. $\exists e_s \exists x_s \left[\begin{array}{l} \mathbf{decide}(e_s) \wedge \mathbf{committee}(x_s) \wedge \text{AGENT}(e_s) = x_s \wedge \\ \text{THEME}(e_s) = \iota y_s. \mathbf{proposal}(y_s) \wedge \dots \end{array} \right]$

The difference between how groups profile their members is cashed out via additional specifications of the frame. First, we observe that many group nouns at the *committee* end of the scale are denote groups that are created by social acts; committees and clubs, for instance, are created by rules, laws, or charters. We assume a social-level event we call **charter** in the frame for these types of groups that represents the event that creates the group; the group is the created object (via the CREATED-OBJECT attribute) of this event.

- (11) $\llbracket \textit{committee} \rrbracket = \lambda x_s \exists x_o \exists e_s \left[\begin{array}{l} \mathbf{committee}(x_s) \wedge \text{IMPL}(x_s) = x_o \wedge \\ \mathbf{charter}(e_s) \wedge \text{CREATED-OBJECT}(e_s) = x_s \wedge \dots \end{array} \right]$

However, not all groups are announced by acts of creation. For instance, couples (as in a couple who are dating) are not usually formed through some social act of creation, but are rather created through considering certain individuals to be a couple due to circumstances. Moreover, while groups created through social acts of creation, such as committees, are not dependent on their membership being stable over time (clubs and committees can change membership, but remain the same club or committee), other groups such as couples are wholly dependent on their members; a couple cannot remain a couple if they are not dating. The examples in (12) and (13)

demonstrate these facts linguistically.

- (12) a. The committee was founded in March, but ...
 b. ??The couple began in March, but ...
- (13) a. The senator left the committee, but the committee continued with its mandate.
 b. #Kevin stopped dating Kendra, but they remained a couple.

Therefore, *couple*-type nouns must have a different frame structure. Groups of this type still have an IMPL attribute that maps from the group to the members, but the key difference is the inclusion of the C-CONST relation.

$$(14) \quad \llbracket \textit{couple} \rrbracket = \lambda x_s \exists x_o \left[\mathbf{couple}(x_s) \wedge \text{IMPL}(x_s) = x_o \wedge \text{C-CONST}(x_o, x_s) \wedge \right. \\ \left. \exists y_o, z_o [x_o = y_o \oplus z_o \wedge \mathbf{person}(y_o) \wedge \mathbf{person}(z_o)] \wedge \dots \right]$$

The role of C-CONST in this frame is to set up a loose identity relationship between the group and its members. Groups are not identical to their members, but the C-CONST relation asserts that certain individuals count as a group in certain circumstances. In other words, under the right circumstances (e.g., dating, marriage, etc.) two individuals will count as a couple. This is an extension of the notion of “level-generation” in Anderson & Löbner to appear, which relates distinct levels of the social ontology to each other.

5 Modification and predication

We take attributive adjectives to specify a value or constrain values of an attribute within a frame. For instance, an adjective such as *young* constrains the permissible range of values for an AGE attribute to those values that count as young.⁴ Modifiers can select for particular types of entities within a frame, e.g. social entities or concrete entities; for instance, *young* and *blonde* denote frame attributes with domains of concrete entities.

- (15) a. $\llbracket \textit{young} \rrbracket = \lambda x_o. \text{AGE}(x_o) = \mathbf{young}$
 b. $\llbracket \textit{blonde} \rrbracket = \lambda x_o. \text{COLOR}(\text{HAIR}(x_o)) = \mathbf{blonde}$

Modification is unification of the adjective frame with the noun frame. With *couple*-type groups, unification of the adjective with the noun results in the adjective targeting the value of the IMPL attribute (see (16)). A rule extends the attribute to members of the plurality (e.g., (17)).

- (16) $\llbracket \textit{young couple} \rrbracket = \lambda x_s \exists x_o [\mathbf{couple}(x_s) \wedge \text{AGE}(\text{IMPL}(x_s)) = \mathbf{young} \wedge \dots]$
 (17) If x_o is not atomic, $\text{AGE}(x_o) = \mathbf{young} \leftrightarrow \forall y_o [y_o \sqsubset x_o \wedge \mathbf{person}(y_o) \wedge \text{AGE}(y_o) = \mathbf{young}]$

Social entities (the groups themselves) may also have frame attributes associated with them. Adjectives such as *advisory* (*advisory committee*), *important* (*important committee*) and *old* may target attributes of the social entity. In doing so, they avoid predicating of the members of the group, and rather specify values of attributes of the group.

- (18) a. $\llbracket \textit{advisory committee} \rrbracket = \lambda x_s \exists e [\mathbf{committee}(x_s) \wedge \text{PURPOSE}(x_s) = e \wedge \mathbf{advise}(e)]$
 b. $\llbracket \textit{old family} \rrbracket = \lambda x_s \exists x_o [\mathbf{family}(x_s) \wedge \text{AGE}(x_s) = \mathbf{old} \wedge \text{IMPL}(x_s) = x_o \wedge \dots]$

Differences in modification potential of different group nouns arise not from the modifiers, but from the nouns themselves. As discussed previously, groups differ in their creation conditions;

⁴ Some details regarding contextually supplied standards are necessary here but not crucial for the discussion.

some groups are created through social acts of creation, while others are created by categorization of some individuals as another individual via C-CONST. It is this latter relation that makes members more accessible in *couple*-type groups. The reason for this, it seems, is that adding this relation allows for a metonymy between the group and the members of the group to be constructed, a weak type of identity between the group and the members. Metonymies are familiar from examples such as *France won the World Cup*, where France is equated with the French football team. As Löbner (2013) and Schulzek (2014) observe, a basic condition for metonymy (within frame semantics) is bidirectional functionality, where an attribute maps to a value which has an attribute linking back to the original value. Although the C-CONST is not functional (it is relational), its inclusion in a frame provides for bidirectionality between the group and the members of the group, thus forming a metonymy. No metonymic relationship holds between groups and their members for other types of groups, such as committees.

6 Conclusion

Modification of group nouns provides evidence for two levels of meaning represented within their lexical semantics: a level pertaining to the group as a social construction, and a level pertaining to the members of the group. By enriching the semantic ontology with social individuals, we are able to model this distinction between groups and their members in a simple and elegant way. This work shows how puzzles in the semantics of groups, such as accessibility of members, can be solved via closer investigation of the conceptual structure of groups and importing this conceptual information into the formal semantic representation.

References

- Anderson, Curt & Sebastian Löbner. to appear. Roles and the compositional semantics of role-denoting relational adjectives. In *Proceedings of Sinn und Bedeutung 22*, 1–18.
- Barsalou, Lawrence. 1992. Frames, concepts, and conceptual fields. In Adrienne Lehrer & Eva Feder Kittay (eds.), *Frames, fields, and contrasts: New essays in semantic and lexical organization*, 21–74. Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Carpenter, Bob. 1992. *The logic of typed feature structures*. Cambridge University Press.
- Joosten, Frank, Gert De Sutter, Denis Drieghe, Stef Grondelaers, Robert J. Hartsuiker & Dirk Speelman. 2007. Dutch collective nouns and conceptual profiling. *Linguistics* 45(1). 85–132.
- Kallmeyer, Laura & Rainer Osswald. 2014. Syntax-driven semantic frame composition in lexicalized tree adjoining grammars. *Journal of Language Modelling* 1(2). 267–330.
- Löbner, Sebastian. 2013. *Understanding semantics*. Routledge.
- Löbner, Sebastian. 2014. Evidence for frames from human language. In Thomas Gamerschlag, Doris Gerland, Rainer Osswald & Wiebke Petersen (eds.), *Frames and concept types*, 23–67. Springer.
- Löbner, Sebastian. 2017. Frame theory with first-order comparators: Modeling the lexical meaning of punctual verbs of change with frames. In Helle Hvid Hansen, Sarah E. Murray, Mehrnoosh Sadzadeh & Henk Zeevat (eds.), *Logic, language, and computation: 11th international Tbilisi symposium on logic, language, and computation*, 98–117. Springer.
- Petersen, Wiebke. 2007. Representation of concepts as frames. *The Baltic International Yearbook of Cognition, Logic and Communication* 2. 151–170.
- Schulzek, Daniel. 2014. A frame approach to metonymical processes in some common types of German word formation. In Thomas Gamerschlag, Doris Gerland, Rainer Osswald & Wiebke Petersen (eds.), *Frames and concept types*, 221–242. Springer.
- Searle, John R. 1995. *The construction of social reality*. Simon and Schuster.