Contiguity and membership and the typology of collective nouns[1]

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Abstract. In the semantics of human collective nouns there are two mechanisms at work, leading to distinct types of collectivity. The collectivity of 'crowds' is based on the *contiguity* of its elements, while the contiguity of 'clubs' is based on *membership* in a social institution. This proposal strengthens and unifies earlier proposals about the nature and typology of collective nouns; it accounts for a range of new and old observations about the variety of collective nouns and it connects to recent insights in the study of collective reference more generally.

Keywords: collectivity, contiguity, membership.

1. Introduction

A collective noun like *club* or *crowd* refers to a set of people as a whole, as intuitively represented in the picture in the middle of Figure 1. One of the central questions in the study of such nouns concerns the basis of their collectivity: what makes a set of people a whole of some sort, so that we can refer to it with a singular noun (see de Vries, 2019 for a recent review)? This paper contributes to this question by identifying two subtypes of (human) collections that are, in a sense, formed in opposite ways: what I call 'crowds' and 'clubs', with their corresponding nouns.

(1)   'crowd' nouns: circle, crowd, horde, mass, procession, queue, throng
         'club' nouns: cabinet, choir, church, club, collective, committee, company, corps

The collectivity of 'crowds' (corresponding to the $\rightarrow$ arrow in Figure 1) starts with a set of individuals that are spatially *contiguous* and close enough to form a whole 'around' them. The collectivity of 'clubs' (corresponding to the $\leftarrow$ arrow in Figure 1) starts with a whole that can have *members* 'in' it.
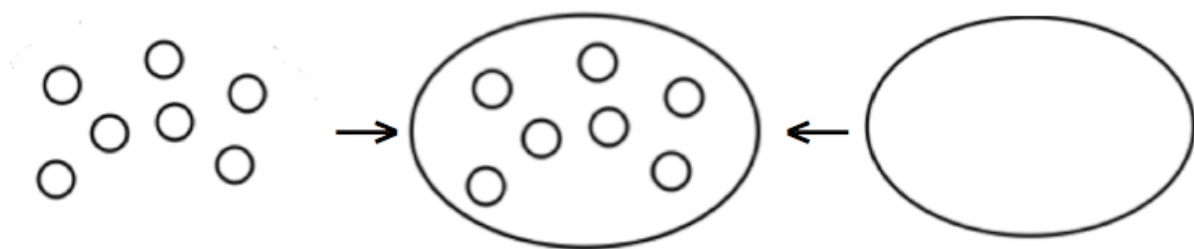

Figure 1: Two ways of forming collections

Collective nouns of both types show the same duality of 'one' (the whole) versus 'more' (the parts), but they differ in how this configuration is derived.

This proposal strengthens and unifies earlier proposals about the nature and typology of collective nouns (Anderson, 2018; Dočekal & Wągiel, 2018; Henderson, 2017; Joosten, 2010; Pearson, 2011); it accounts for a range of new and old observations about the variety of collective nouns, and it connects to recent insights in the study of collective reference more generally (Kruitwagen et al., 2017). By restricting its scope to *human* collective nouns, this typology neutralizes the confounding effect of animacy (de Vries, 2015) allowing us to see that both types of collectives actually show plural behaviour (*pace* Henderson, 2017; Pearson, 2011).

The paper starts by showing that Joosten's (2010) notion of *contiguity* works for crowds, but not for clubs (section 1). Instead, clubs are based on a social notion of *membership* (section 2). After a sketch of how this distinction is formalized (section 3), I discuss a range of empirical consequences of this distinction (based on Dutch, section 4). Section 5 shows that the club/crowd distinction is independent of the singular/plural behaviour of collectives, which is a function of the animacy of its elements. Section 6 wraps up the paper.

2. The contiguity of crowds

What makes a set of individuals a collection? Joosten (2010, p. 38) makes a suggestion that is based on *contiguity* (see also Joosten and Vermeire, 2006):

> the individual entities are related to each other by contiguity, by an external bond. The specific nature of that external relation can be of different sorts — spatio-temporal (*archipel*, *troupeau*), social (*couple*, *tribu*), cooperative (*club*, *armée*), or functional (*couvert*, *paire (de chaussures)*) — but in any case the basis on which the individual entities are grouped, is contiguity.

The idea of Joosten is that the elements of a collection are close together (contiguous) because of how they are related to each other in a particular way. He illustrates this by lines connecting the elements in the central picture of Figure 1, representing this "external relation". Intuitively, it is because of these connections that a collection hangs together, in his view. Joosten and Vermeire (2006) characterize social, cooperative, and functional contiguity as "strong" and spatio-temporal contiguity as "weak", because of the more permanent status of the first three across time and space.

However, we need to take a critical look at how an "external relation" actually contributes to collectivity. It turns out that spatio-temporal contiguity works well as a collectivizing factor for a subset of the collective nouns (what I call 'crowds'), but that the other types of contiguity do not lead to collectivity in the way that Joosten would want it (for what I call 'clubs').

Consider again nouns like *circle*, *crowd*, *horde*, *mass*, *procession*, *queue*, and *throng*. If there is a sufficient number of people that are close enough to each other to form a spatial pattern, then that can be a basis for grouping them into a whole and for calling that whole a crowd or

a queue, for instance. The "external bond" is a particular spatial relation holding between elements, like closeness or adjacency, that creates the higher-order collection with its own spatial properties (like size, shape, and orientation).

More generally, contiguity holds for the wider type of collectivity that Henderson (2017, p. 161) calls "*swarm* reference, [which] picks out higher-order collective entities defined in terms of the spatial and temporal configuration of their constituent individuals." In this class we find the rich variety of animal collectives (like *herd*, *flock*, *shoal*, etc.). Joosten's notion of spatial contiguity also corresponds to Grimm's (2012) spatial *connectedness* in his "mereotopology" of collective aggregates, which are types of entities (like insects, for instance) that tend to occur clustered together and to be named by mass nouns or non-derived plurals across languages. Mador-Haim & Winter (2015, p. 467) and De Vries (2015, pp. 22–23, 129) argue that the possibility of a plural definite like *the ticket inspectors* to have atomic reference (like *the row of ticket inspectors*) also depends on the individuals being 'lined up'. In other words, there is an emerging type of collectivity in the literature that relies on spatial contiguity in a crucial way.

Contiguity also corresponds in an interesting way to the notion of *convexity* in the conceptual space sense of Gärdenfors (2000). Crowd type collections are convex with respect to an appropriate notion of 'betweenness' holding over an underlying space. This is illustrated by the entailment pattern in (2a), that shows that a crowd type collection is closed under betweenness. Note that what counts as 'between' is sensitive to the shape of the collection, as amply discussed for German *zwischen* in Habel (1989).

(2) a. A and B are part of the crowd/circle/queue.
         C is between A and B.
         $\Rightarrow$ C is part of the crowd/circle/queue.
     b. A and B are part of generation X.
         C's birthday is between A's and B's birthdays.
         $\Rightarrow$ C is part of generation X.

(2b) gives a temporal example of convexity, featuring the temporal collective noun *generation*. The boundaries of a generation may be notoriously vague, but the convexity demonstrated in (2b) is a clear matter. Beyond space and time, collective nouns like *class* or *stratum* might be convex with respect to an underlying economic scale (of income, for instance).

However, it is not clear how we could apply this kind of contiguity to all collectives, as Joosten suggests. Specifically, contiguity does not work for the kind of human collections that I have labeled as clubs, like cabinets, clubs, and committees. Joosten suggests that clubs and armies are based on cooperation, but that can be shown to be incorrect. To start with, cooperation is not a sufficient condition for constituting a committee or army, as the invalid entailments in (3) show.

(3) a. A and B are part of committee X.
         C is cooperating with both A and B.
         $\not\Rightarrow$ C is a part of committee X.

     b.   A collaborates with the army of the enemy.

         ⇏ A is part of the army of the enemy.

In order to make sense of contiguity in these situations (in analogy with the spatio-temporal case), we would have to say for (3a) that C is 'between' two members A and B of a committee if C is cooperating with both (or maybe even mediating between them). However, this does not make C a part of the committee. Similarly, in (3b), collaboration with the army of the enemy does not make somebody part of the army of the enemy.

Furthermore, cooperation is neither a necessary condition for being part of a committee or army. The examples in (4) are not contradictions, as one would expect when collaborative connections are constitutive for committees and armies.

(4)   a.   A is part of the committee, but not cooperating with other people in the committee.

      b.   A is part of the army, but only collaborating with the enemy.

So, contiguity only makes sense for a relatively small class of collections, with a small number of underlying domains (at least space and time), but it does not work for the much larger class of collections that involve social, collaborative or functional relations. The question is then what other basis there could be for forming collections. This is where membership comes in.

2. The membership of clubs

There is a general notion of membership, used in mathematics (a set with its members) and metalinguistically, for instance, in the semantics of groups (collections) of Barker (1992); where each group is mapped to a set of its members in virtue of a general membership function. However, the actual linguistic use of the corresponding word in natural language turns out to be much more restricted. This is illustrated with data from Dutch, featuring the word *lid* 'member' (5).[2]

(5)   a.   Anna is een lid van de club / het comité / de kerk.

         'Anna is a member of the club / committee / church.'

      b.   ?Anna is een lid van de kring / menigte / rij.

         'Anna is a member of the circle / crowd / queue.'

While one can say that Anna is a member of a club, committee or church in Dutch (5a), this is not possible for any of the crowd nouns (5b). The first argument of the relation denoted by

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[2] I do not know whether counterparts of *lid* in other languages (English *member*, German *Glied*) show the same restricted behaviour, but even if they are more general now, they must have had a more restricted application. The basis for this assumption is the fact that 'member' words in different European languages (Latin *membrum*, Greek *melos*, German *Glied*) started with a physical 'limb' meaning. They developed a social member meaning because the human body was used as the metaphorical source domain for social structures (like society, church, family) with limbs of the body standing figuratively for human parts of the social structure.

lid must be a human being and the second argument of the relation can only be a collection of a particular, social type.[3]

A similar observation has been made by Joosten and Vermeire (2006) on the basis of compounds headed by *lid*. They found compounds like *clublid* 'club member' and *comitélid* 'committee member', but no compounds like *menigtelid* 'crowd member' or *rijlid* 'queue member'. (*Kerk* 'church' was not in their data set as a collection. The noun *kringlid* 'circle member' does exist, but only with the social 'group' meaning of *kring*, not the spatial 'circle' meaning.)

This restriction suggests that the kind of membership that is associated with the word *lid* is not a 'brute fact' (like being part of a crowd) or an abstract mathematical notion (like being an element of a set), but an 'institutional fact', a socially recognized 'status' that a person shares with other persons (Searle, 1995). This status does not have to be official or formalized; groups without a formal status can also have members, as long as their existence and membership is socially recognized. Membership typically involves activities for a member, but the activities do not themselves establish membership. As we already saw, one can be a member of a committee without showing any activity that would be required for that membership.

This brings us to the following generalization. Within the class of human collective nouns, we can distinguish two subclasses, crowd nouns and club nouns. Crowd nouns show contiguity but have no membership; clubs have members, but no contiguity.

There are collective nouns that can not be straightforwardly classified as either crowd noun or club noun, given the criteria. The noun *echtpaar* 'couple' clearly seems to refer to a (very small) social group, but it does not occur with *lid* (6a). It seems then that the use of *lid* is restricted by factors that are independent of the crowd/club distinction, although the nature and strength of these factors is unclear. To me it sounds strange to talk about a member of the army (6b), but actually, examples of this phrase can easily be found on the web. It is conceivable that a salient word like *soldaat* 'soldier' blocks the periphrastic member construction in most contexts.[4]

(6)   a.   *een lid van het echtpaar
              a member of the couple
        b.   ?een lid van het leger
              a member of the army

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[3] With the exception of biological classifications (e.g. *het enige lid van de onderfamilie Rousseoideae* 'the only member of the subfamily Rousseoideae'), which are based on a conceptual metaphor that maps on a source domain of human collections (like families).

[4] Such restrictions are also found in other languages (Yoad Winter, personal communication). The Hebrew word *xaver* ('member, friend') is not used for *miSpaxa* 'family', but the word *ben* 'son' is preferred instead. However, with other collectives (like *zug* 'couple'), this noun or its female counterpart *bat* 'daughter' does not express membership: *ben/bat-zug* does not mean 'member of couple' but 'husband'/'wife', respectively. Clearly, across languages, there are lexical idiosyncrasies that disturb the general behaviour of membership nouns.

We also need to recognize the existence of club nouns of which the membership might partially interact with 'brute facts'. The membership of a family, for instance, is not just a purely social affair, but it also typically involves natural, consanguinal relations (in addition to relations that are based on marriage (affinal kinship) and adoption (fictive kinship)). Still, we can talk about members of a family in a general way, ignoring the types of kinship. Collectives like *people* or *population* also have complex constitutive factors, combining 'brute' contiguity (e.g., their territory) with 'social' membership.

Sometimes, membership and contiguity may go together in typical ways. A typical choir has a form of institutional membership, but its members will also come together and sing the same song simultaneously. Only atypical choirs have members scattered over the globe that have never sung together or that work like a 'flash mob'. In this case, we can see the two collective factors of contiguity and membership as conceptual preferences in the concept of a choir, potentially converging with the recent findings about collective verbs in Kruitwagen et al. (2017). These authors demonstrate that the typicality of an event *e* in the category of a collective *hug* of two people A and B depends on the factor of *participation* of A and B (a more physical, spatial matter) and the factor of *collective intentionality* of A and B (a more psychological, social matter).

3. Membranes and members

In the formal semantic literature, collections have been treated as *atoms* (Barker, 1992) or, alternatively, as *sets* of individuals (see de Vries, in press for a recent overview), with appropriate shifts between these two types of denotations. It is not the objective of this paper to work out a semantics of collectivity along one of these two lines. Therefore, I have chosen to represent collections here in a way that gives priority to making the proposal explicit, without making the ontology too heavy. The question of how an atom-based or set-based approach can best accommodate contiguity and membership needs to be postponed to another occasion.

Collections are represented here as pairs $\langle X,c \rangle$ of a set of entities X and an atom c, corresponding to the parts and the whole that are graphically represented in the middle of Figure 1. A collection is an atomic entity c (type e) that is associated to a set of elements X (type et), more or less like in Barker (1992). The two components of a collection can be related to each other by two opposite mappings (7) that I will call **membrane** and **members**.

(7)   **membrane**$_{(et)e}$ maps a set of individuals to its whole (for 'crowds')
       members$_{e(et)}$ maps a whole to its set of members (for 'clubs')

The **membrane** mapping is a partial function, only defined for a set X of individuals that at a world-time index i is in a contiguous spatial configuration. In that case the individuals together cover a spatial region (its 'eigenspace' or 'spatial trace') that is systematically related to the regions that are occupied by the individuals, as worked out in Henderson (2017) for 'swarm' reference and discussed briefly in Mador-Haim & Winter (2015) for collectives like *mountain range* or *row of utility poles*. This **membrane** function is part of what constitutes crowds.

The **members** mapping is also a partial function because it is only defined for certain regions (the social ones). If it is defined for an atom c, then it yields for each world-time index i a (possibly empty) set X of members of c. It is because of the dependence of the **members** function on world-time indices that an atom c for which **members** is defined leads to an individual concept (Pearson, 2011). A noun phrase like *the committee* can correspond to a function from indices to sets because the underlying atomic collection has different members at different indices. This **members** function is relevant for club type collections.

Even though **membrane** and **members** are opposite mappings, they are not each other's inverses, i.e., it is not the case that **membrane**(**members**(c)) = c and **members**(**membrane**(X)) = X. If c is a choir, then **membrane**(**members**(c)) does not return the same club collection that it started with, but the crowd collection that corresponds to its members (if they choir members satisfy the spatial conditions for a crowd). And **members**(**membrane**(X)) is not a possible composition of functions because the crowd collection yielded by **membrane**(X) cannot be an argument of the **members** function (that requires a club collection as its argument).

The denotations of collective nouns like *queue* and *committee* are modeled here as sets of ordered pairs, as defined in (8). The idea is that a queue starts with a group of people X that form a collective entity c that has the shape of a queue (8a) and that a committee starts with a collective entity c that has a set of members X (8b).

(8) a. ⟦ queue ⟧^{i} = { ⟨X,c⟩ : **people**(X) ∧ **queue**(c) ∧ **membrane**$_i$(X)=c]
     b. ⟦ committee ⟧^{i} = { ⟨X,c⟩ : **committee**(c) ∧ **members**$_i$(c)=X]

The core of both definitions is a condition on a collective whole c. The predicate **queue** defines the spatial properties of a queue (thin, linear shape, horizontal orientation).[5] The predicate **committee** picks out collective wholes with a particular role in a larger social structure. In both definitions, the collective whole is related to a set of people, leading to the same type of denotation but in opposite directions. In (8a), there is a separate specification that the elements of X are people (to distinguish it from crowd type collections that consist of animals). This restriction is already implied by the **members** function in (8b). The i in (8) is the world-time index, making the ⟨X,r⟩ pairs dependent on the index-dependent functions **membrane** and **members** (and possibly other index-dependent properties in the definition).

4. Differences (in Dutch) between clubs and crowds

Against the background of the characterization of clubs and crowds laid out in the previous sections, I will now discuss two sets of empirical differences between these two types of collections. The data are from Dutch (but the crowd/club is not restricted to Dutch, of course, and I assume that such empirical differences can be found in other languages too). Some of the differences have been noted in earlier work, some of the observations are new. The first set of differences is related to crowds being spatial in a literal, physical way while clubs can

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[5] This does not exhaust the conceptual content of *queue*. The persons in a queue will also have a particular orientation with respect to the queue as a whole (looking forward) and the queue itself will typically be oriented with respect to a desk or an entrance. This might also be related to the intentions that a person has with being in the queue, a property that might be true for crowds more generally.

only be spatial in a figurative, functional way. The second set of differences has to do with the more independent existence of clubs with respect to their parts than crowds have (see also Joosten and Vermeire, 2006). Finally, I will also show how the club/crowd ambiguity of certain collective nouns supports the distinction between these types.

4.1. Spatial and non-spatial collections

The verb *zitten* 'to sit' in Dutch has a posture sense (like its English counterpart) in combination with locative PPs (9a), but (unlike its English counterpart) it loses the posture implication with PPs that do not refer to a literal location but to participation in an institution (9b).

(9)   a.   Ada zit op het grasveld / in de fauteuil.
               Ada sit on the lawn / in the armchair
               'Ada is sitting on the lawn / in the armchair.'   (posture)
      b.   Bob zit op school / in de gevangenis.
               Bob sit on school / in the prison
               'Bob is in school / in prison.'   (no posture)

With crowd nouns *zitten* entails a literal sitting posture (10a), but with club nouns there is no entailment of such a posture (10b).

(10) a.   Anna zit in een menigte / rij.
               Anna sit in a crowd / queue
               'Anna is part of a crowd / queue <u>and sitting</u>.'   (posture)
      b.   Anna zit in een comité / koor.
               Anna sit in a committee / choir
               'Anna is part of a committee / choir.'   (no posture)

This supports the way crowds and clubs have been characterized: crowds are spatial (hence the spatial use of the preposition *in* and the verb *zitten*), but clubs are not (hence their figurative use).

We see something similar with verb-preposition combinations like *stappen uit* that has a literal meaning ('take a step out of (something)') with crowd nouns and a figurative meaning ('step down from (something)') with club nouns.

(11) a.   Anna stapte uit de menigte.
               Anna stepped out the crowd
               'Anna stepped out of the crowd.'   (literal stepping)
      b.   Anna stapte uit het comité.
               Anna step out the committee
               'Anna stepped down from the committee.'   (figurative stepping)

The preposition *binnen* 'within, inside' requires an object with a physical boundary. It can not be used with a crowd noun: even though a crowd has a spatial extension, it does not have

a boundary. However, interestingly, *binnen* is possible with club nouns: not because the corresponding collections have physical boundaries, but because *binnen* shifts to a figurative meaning. This again the supports the proposal that crowds occupy spatial regions and clubs are only spatial in a figurative sense.

(12) a.   ?Er is een conflict binnen de menigte.   (literal, but no boundary)
             there is a conflict within the crowd
             'There is a conflict within the crowd.'
       b.   Er is een conflict binnen het comité.   (figurative boundary)
             There is a conflict within the committee
             'There is a conflict within the committee.'

The preposition *in* can be modified with the noun *midden* 'middle' making its spatial location more precise. The PPs in (13) show that this is possible with crowd nouns (13a), because they support a spatial region, but not with club nouns (13b).[6]

(13) a.   midden in een menigte   (spatial modification of P)
             middle in a crowd
             'in the middle of a crowd'
       b.   ?midden in een comité   (no spatial modification of P)
             middle in a committee
             'in the middle of a committee'

As Henderson (2017) already pointed out for swarm nouns, the crowd nouns themselves allow modification with spatial adjectives (14a), but not the club nouns (14b). (But crucially, *breed* 'wide' can get a figurative meaning in (14a), referring to the varied membership of the commitee.)

(14) a.   een dichte/brede menigte   (spatial modification of N)
             'a dense/wide crowd'
       b.   ?een dicht/breed comité   (no spatial modification of N)
             'a dense/wide committee'

Finally, the spatial preposition *tussen* 'among' leads to different entailments for crowds and clubs. Standing among a crowd (15a) necessarily implies being part of that crowd (15a'), but standing among a cabinet (15b) does not imply being part of that cabinet (15b').

(15) a.   Anna staat tussen de menigte.
             Anna stands between the crowd
             'Anna is standing among the crowd.'
       a'.   ⇒ Anna is deel van de menigte.
             'Anna is part of the crowd.'   (spatial inclusion)
       b.   Anna staat tussen het kabinet.
             Anna staat between the cabinet
             'Anna is standing among the cabinet.'

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[6] Other prepositions expressions with *midden*, or its synonyms, like *in het midden van* 'in the middle of' or *te midden van* 'in the midst of' might behave differently. The distinction in (13) concerns the modifier *midden*.

b'   ⇏ Anna is deel van het kabinet.
       'Anna is part of the cabinet.'   (no spatial inclusion)

4.2. Dependent and independent regions

The existence of crowds depend on a set of people being in a particular configuration. The **membrane** function maps from a set to a region. The parts come first and the whole depends on those parts. Clubs, on the other hand, can have an existence that is more independent of their parts. The **members** function maps a collective whole to the people that are members of it. The whole comes first and the parts depend on it. See Joosten and Vermeire (2006) for a similar distinction among collections (using the terms "bottom-up" and "synthetic" versus "top-down" and "analytic").

One result of this difference is that clubs can have names, as in (16), something which is inconceivable with crowds.

(16) *de familie de Wit* 'the de Wit family', *het kabinet Rutte* 'the Rutte cabinet', *Hervormd Kerkkoor Urk* 'Reformed Church Choir Urk'

Clubs are also more than just a contiguous set of people, like crowds are. Clubs can have social structure (Ritchie, 2013) with roles (e.g., a chairperson), and entities (regulations, repertoire, weapons, ...). Clubs can also be 'vacant' (e.g., a choir without members), but crowds cannot (e.g., there is no queue without people). There can be different clubs with the same elements (e.g., a programme committee and a exam committee with the same members), but the same group of people queuing before the door on different occasions, is the same queue. This makes sense if the identity of crowds is based on their parts, but the identity of clubs is based on their whole. This property of clubs is what Gil (1996), writing about collective nouns in general, calls *non-additivity*. When two crowds merge the result is one crowd, but this does not happen the same way with committees or other club type collections.

There is also a grammatical effect of this distinction, seen in pseudo-partitives (Joosten and Vermeire, 2006).[7] Dutch has two pseudo-partitive constructions, one with the preposition *van* 'of' (17a) and one without it ("juxtaposition") (17b).

(17) a.   een comité <u>van</u> deskundigen
             a committee of experts
             'a committee of experts'
      b.   een menigte ∅ deskundigen
             a crowd experts
             'a crowd of experts'

Using large corpora, Joosten and Vermeire studied the distribution of 134 collective nouns (with both animate and non-animate elements) over these two constructions.[8] The human

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[7] See Matushansky (2017) for a recent general discussion of syntactic and semantic aspects of pseudo-partitives.

collective nouns from their data set are reproduced in (18), in the categories that these authors distinguished.

(18) a.   Mainly prepositional: *band* 'band', *bedrijf* 'company', *bemanning* 'crew', *beweging* 'movement', *bond* 'alliance', *brigade* 'brigade', *bureau* 'office', clan 'clan', *club* 'club', *collectief* 'collective', *college* 'college', *comité* 'committee', *commissie* 'committee', *compagnie* 'company', *corporatie* 'corporation', *denktank* 'think tank', *departement* 'department', *directie* 'management', *dynastie* 'dynasty', *elftal* 'football team', *ensemble* 'ensemble', *familie* 'family', *firma* 'firm', *fractie* 'party', *gang* 'gang', *gemeenschap* 'community', *genootschap* 'society', *geslacht* 'lineage', *gezin* 'household', *gilde* 'guild', *groepering* 'faction', *harmonie* 'brass band', *jury* 'jury', *kabinet* 'cabinet', *kaste* 'cast', *klasse* '(social) class', *koor* 'choir', *kring* 'circle (class)', *maatschappij* 'company', *minderheid* 'minority', *ministerie* 'ministry', *netwerk* 'network', *orde* 'order', *organisatie* 'organisation', *orkest* 'orchestra', *panel* 'panel', *partij* 'party', *presidium* 'presidium', *publiek* 'audience', *raad* 'council', *redactie* 'editorial board', *regering* 'government', *sekte* 'cult', *staf* 'staff', *stam* 'tribe', *vennootschap* 'company', *vereniging* 'society', *volk* 'nation', *voorhoede* 'vanguard'

b.   Both prepositional and juxtaposed: *afdeling* 'division', *bende* 'gang', *delegatie* 'delegation', *drom* 'throng', *garde* 'guard', *generatie* 'generation', *gezelschap* 'gathering, society', *groep* 'group', *harem* 'harem', *klas* '(school) class', *kliek* 'clique', *korps* 'corps', *kwartet* 'quartet', *leger* 'army', *legioen* 'legion, host', *menigte* 'crowd', *militie* 'militia', *patrouille* 'patrol', *peloton* 'pack (sport)', *ploeg* 'shift', *populatie* 'population', *ras* 'race', regiment 'regiment', *rij* 'queue', *school* 'school (in science, arts)', *selectie* 'selection (sport)', *team* 'team', *troep* 'troop (of soldiers)'

c.   Mainly juxtaposed: *bende* 'troop', *club* 'crowd', *colonne* 'column', *drietal* 'trio', *duo* 'duo', *(oude) garde* '(old) guard', *horde* 'horde, *kwartet* 'group of four people', *massa* 'mass', *meute* 'pack', *paar* 'pair', *schare* 'multitude', *stel* 'lot', *trio* 'trio', *troep* 'troop'

In category (18a), we find no clear instances of crowd nouns (i.e., referring to spatially or temporally defined collections), and in category (18c), we find no clear instances of club nouns (i.e., referring to socially defined collections). The typical crowd nouns always allow juxtaposition (i.e., they are found in category (18b) and (18c)) and the typical club nouns always allow a preposition (i.e., they are found in category (18a) and (18b)).

There are different ways to implement this difference at the syntax-semantics interface, but the underlying idea is always that crowd nouns are more dependent on a specification of their elements than club nouns. Joosten and Vermeire (2007) offer an iconicity-based account (closer syntactic dependency mirrors closer semantic dependency). Seen from another functionalist (economy-based) perspective, the preposition is missing with those collective nouns that occur more frequently with a complement (leading to a shorter construction for a more frequent occurrence). A more semantic (not incompatible) way of approaching the difference is by allowing only some collective nouns (including the crowd nouns) to have an

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[8] They also looked at the distribution in compounds, but those results will be ignored here.

additional functional type that allows them to take their nominal complement directly as an argument, as in (19a), without the help of a preposition. Other collective nouns (including most club nouns) do not have this functional type and they need the preposition to connect the collection to its members, as in (19b).

(19) a.   ⟦ menigte ⟧ (⟦ deskundigen ⟧) =
              λP { $\langle X,c \rangle$: $P(X) \wedge$ **human**$(X) \wedge$ **membrane**$(X) = c \wedge$ **crowd**(c) } (*expert)
      b.   ⟦ van deskundigen ⟧ (⟦ comité ⟧) =
              λC { $\langle X,c \rangle$: *expert$(X) \wedge$ **members**$(c) = X \wedge C(c)$ } (**committee**)

As a result, the compositional direction of application differs between crowd and club nouns, because of how the **membrane** and **members** differ in their directionality.

4.3. Club/crowd ambiguities

The lists in (18) already reveal that some nouns occur with different meanings and in different categories. The noun *bende*, for instance, has a more basic club type meaning ('criminal gang', (20a)), but it can also have a non-criminal crowd type meaning (20b), and the use of the preposition corresponds with the nature of those two meanings.

(20) a.   een bende (van) valsemunters   (a club type noun)
              a gang of counterfeiters
              'a <u>gang</u> of counterfeiters'
      b.   een bende (*van) scholieren   (a crowd type noun)
              a gang of pupils
              'a <u>troop</u> of pupils'

We see something similar with the nouns *club* (social club or crowd), *kring* (spatial circle or social group), *leger* (army or crowd), *legioen* (military unit or crowd).[9]

Whatever the (metaphorical or other) meaning shifts involved might be, this ambiguity is another piece of evidence for the crowd/club distinction and the differences that accompany it. It is therefore not an accident that the noun *kring*, for instance, can be disambiguated in the kind of contexts that we discussed earlier in this section. For example, the spatial meaning of *kring* correlates with the posture meaning of *zitten* (21a), while the social meaning correlates with the non-posture meaning (21b).

(21) a.   in een kring zitten
              'to be part of a circle, <u>sitting</u>'   (a crowd type noun)
      b.   in een kring zitten
              'to be part of a church group'   (a club type noun)

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[9] This (irregular) polysemy is independent of the (maybe more systematic) polysemy that we find for a word like *church*, between the building, the institution, and the people.

5. Singular versus plural behaviour

Crowd nouns are a proper subset of a wider class of collective nouns that has been distinguished in Pearson (2011) (as 'collection' nouns) and Henderson (2017) (as 'swarm' nouns). Both authors also include non-human and non-animate types of collections in their types (like *bunch* or *bouquet*). Both authors also make the claim that the type they identify does not have plural reference (in contrast to a club type noun like *committee*). Pearson claims that her collection nouns do not allow quantification over elements and Henderson that his swarm nouns do not allow plural anaphora. If they are correct, then there is another important difference between crowds and clubs: crowds are more singular (more atomic) and clubs are more plural (more like sums) in their behaviour. Let us consider their arguments more closely.

Pearson points out that (22a) quantifies over any part of the wall (and not only individual bricks), while (22b) quantifies only over individual committee members. Interestingly, (22c) also quantifies over any part of the bunch (not necessarily individual flowers), leading her to the conclusion that *the bunch of flowers* has an atomic denotation (like does *the wall*), but that *the committee* has a plural denotation. However, notice that in (22d), with the noun *crowd*, there is also quantification over individual persons in the crowd, even though *crowd* would not be a committee-type noun.

(22) a.   Half of the wall had been painted yellow.
      b.   Half of the committee had been painted yellow.
      c.   Half of the bunch of flowers had been painted yellow.
      d.   Half of the crowd had been painted yellow.
      (Example a-c from Pearson, 2011, pp. 161–163)

Henderson points out, *the committee* (23a) but not *the bouquet* (23b) can be an antecedent of the plural pronoun *they*. He already points out himself that (23c), with the noun *swarm*, is a problem for his predication that *committee* and *swarm* should behave differently with respect to plural anaphors.

(23) a.   The committee is in the backyard. They are by the river.
      b.   The bouquet is in the backyard. #They are/It is by the river.
      c.   My guess is the swarm will mate, dig down to wherever they lay their eggs, then die.
      (Examples from Henderson, 2017, p. 170)

The crucial factor that needs to taken into account here is that (22d) and (23c) involve collections that have *animate* elements (of human beings in (22d) and of animals in (23c)). It is this animacy that allows collective noun phrases to have plural reference (de Vries, 2015). If we take this into account, then we must conclude that the club/crowd distinction does not involve a plural/singular distinction. There are really two independent dimensions that are relevant for collective nouns (see Table 1), one involving the nature of the collections they denote and the other the nature of the elements of these collections.

Table 1: Two dimensions of collectivity

	social collections based on membership	*spatial collections* based on contiguity
animate collections → plural behaviour	club, committee	crowd, swarm
inanimate collections → no plural behaviour	?	bouquet, bunch

This raises the question whether we have social collections that can have non-animate members (the question mark in Table 1). At first sight the answer must be negative: since members are always human, there can simply be no inanimate collections based on membership. However, the question remains whether there might be sets of objects that form socially instituted collections (instead of just being in a spatial configuration). Take a deck of cards. The 'non-additivity' is obvious: we cannot just bring together a set of playing cards and form a deck of cards; a deck of cards is different from a pile of cards in that it needs to have certain types of cards in order to form a complete deck. What constitutes a deck of cards is a matter of social convention. And this shows that we have potential candidates for that fourth cell (with an appropriate generalization of the relevant notion of social 'membership' of objects in such collections). Whether this type of inanimate collection can be empirically distinguished from other inanimate collections requires further research in that direction.

6. Conclusion

We have seen in this paper that there are at least two ways of forming collections, either starting with a set and forming a whole (using the **membrane** function, forming crowds, with contiguity over a suitable underlying dimension) or by starting with the whole and associating it to its members (using the **members** function, applying to clubs, based on a social notion of membership).

We have to realize that this is only a very partial typology because we have basically compared two proper subsets of a wider set of collective nouns (both animate and non-animate). We have left out a discussion of collective nouns based on a specific cardinality (*couple*, *triumvirate*, *quartet*): it is not clear how they fit in and, more generally, how cardinality comes into the picture. Cardinality seems to constrain both types of collections: we have *elftal* 'football team', *echtpaar* 'married couple', *kwartet* '(musical) quartette' as examples of clubs, but *drietal* or *trio* can also be used to refer to three spatially contiguous people.

The distinction between clubs and crowds made here (mainly on the basis of Dutch data) aligns with earlier distinctions in the literature (Dočekal & Wągiel, 2018; Henderson, 2017; Joosten, 2010; Pearson, 2011) and that literature is also based on data from Czech, English, and Polish. The question is how the club/crowd distinction is reflected lexically and grammatically across different languages and whether this happens in the same rich way as it happens in Dutch.

We saw that the club/crowd distinction is not a binary matter. Collections might be club-like or crowd-like to varying degrees, depending on the way underlying conceptual factors come

together, maybe in interaction with the linguistic and non-linguistic context. This is another area that deserves further empirical study.

Finally, the way clubs and crowds have been provisionally modeled, as pairs of a set and an atom, needs to be worked out in a way that does justice to the complexity of the ontology and semantics of number, as reflected in the literature (e.g., de Vries, 2015, and references given there). Also, the social nature of clubs needs to be worked out in a way that makes clear how it might relate to the notion of *role*, as it comes up in the treatment of Landman (1989) and Zobel (2017) of nouns like *judge*. An individual role, like that of a judge, is similar in some respects to a collective 'role' that a set of people play as a committee, for instance. Ideally, we would want one social ontology of roles (Anderson, 2018), providing us with the building blocks for a semantics of *committee* (collective role), as well as *chair* (individual role). And hopefully such an ontology can also clarify how such roles relate (conceptually or metaphorically) to spatial regions and positions in such a way that we can have a unified semantics of collective nouns.

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