Singular/Plural contrasts: The case of Informational Object Nouns

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1 Introduction. This paper provides a novel contribution to the small but growing literature on the countability of abstract Ns ([3, 7, 10, 11], i.a.). Abstract Ns have been largely set aside in semantic theories of the mass/count distinction, given the notoriously challenging puzzles they pose, e.g., their delimitation as a coherent class and heterogeneity [3, 11]. Therefore, here we focus on one lexical subclass, which we label *Informational Object Nouns* (IONs) (following [9]). These are Ns that (i) take propositional complements and accept *is true/false* predications, (ii) are derived from Psych verbs (*knowledge, belief, opinion*) or verbs that denote speech act events (*statement, assertion, utterance*).

What all IONs share is that they have a proposition-denoting sense/use. Those derived from Psych verbs also have another sense that refers to a stative *relation* to a proposition (e.g., that of believing it), which we model as denoting a set of STATES. IONs like *statement, assertion, utterance* also have a sense that denotes a set of dynamic EVENT of stating/asserting etc. We argue that count IONs can be individuated in different ways, depending on whether or not the eventuality specified in their lexical entries is a STATE or an EVENT. Moreover, we show that this distinction is perhaps surprisingly related to Carlson's [1] observation about the availability of *transparent/opaque readings* of singular count Ns, on the one hand, and mass Ns, on the other hand. In particular, we discuss interesting interactions with singular/plural contrasts and the available readings of count IONs.

2 Observations. First, as shown by the examples in (1) and (2) IONs do not uniquely determine what counts as one proposition across contexts. In the original corpus examples in (1-a) and (2-a), the singular ION denotes a proposition expressed by a complement clause which is a conjunction of two clauses, but nonetheless they constitute what counts as 'one' proposition in the denotation of the ION. In the minimally modified examples in (1-b) and (2-b), the use of plural IONs individuates each proposition expressed by the two separate conjuncts as *two opinions/statements*:

(1) a. ... the **opinion** that these two German countries belonged together and that the German people should solve their own internal affairs and difficulties. [UKwaC]
b. ... the **opinions** that these two German countries belonged together and that the German people should solve their own internal affairs and difficulties.

(2) a. The Panel is pleased to note the company's **statement** that the product is no longer available and that it would not form part of its Christmas 2001 gift range. [UKwaC]
b. The Panel is pleased to note the company's **statements** that the product is no longer available and that it would not form part of its Christmas 2001 gift range.

Second, we get a meaning contrast for plural subjects when the complement clause is simple (without a conjunction). Take the minimal pair in (3). In (3-a), *belief* refers to, and is individuated in terms of, a single proposition. But, in the same context, the use of the plural *beliefs* in (3-b) forces a reading in which relations to the same proposition are individuated in terms of the Experiencers.

(3) a. it certainly fueled my cousins' **belief** that my family were "snobs".
b. it certainly fueled my cousins' **beliefs** that my family were "snobs". [UKWaC]

For IONs such as *statement*, we get a different alternation. In (4-a) and (4-b), *statement*/*statements* refer to the event(s) in which the statement(s) is/are made. The contrast between the two is that, in (4-a), Franks and Vershbow are joint agents in making the statement, whereas in (4-b), the only reading is that across differentiable events, Franks and Vershbow both made statements that conveyed the same contents (i.e. Carlson's [1] transparent reading).

(4) a. in the wake of US Gen Tommy Franks and US ambassador Alexander Vershbow's **statement** that the US would produce the evidence of Iraqi WMD.
b. in the wake of US Gen Tommy Franks and US ambassador Alexander Vershbow's **statements** that the US would produce the evidence of Iraqi WMD. [BNC]

Third, in line with Carlson's [1] observation that bare plurals (and bare mass nouns), unlike in/definite count singulars, do not force a transparent reading, we find contrasts such as those in (5) and (6). In (5-b), the plural *statements* allows for different officials to have stated all or some of the propositions denoted by the complement clause, whereas the singular *claim* in (5-a) suggests that either the officials jointly stated something, or that over different events, different officials all stated both that Iraq had stockpiles of biological and chemical weapons and was close to having a nuclear weapon.

(5) a. there was no credible evidence to support the Bush administration officials' **statement** that Iraq had stockpiles of biological and chemical weapons and was close to having a nuclear weapon.
b. there was no credible evidence to support the Bush administration officials' **statements** that Iraq had stockpiles of biological and chemical weapons and was close to having a nuclear weapon.

Table 1: Summary of observations

Type	Subject	ION	Complement	Denotation of ION (when definite)	Example No.
Eventive / Stative	SG	SG	complex	1 proposition (or 1 event)	(1-a), (2-a)
	SG	PL	complex	*n* propositions (or *n* events)	(1-b), (2-b)
Eventive	PL	SG	simple	1 proposition / 1 event	(4-a)
	PL	PL	simple	*n* events	(4-b)
Stative	PL	SG	simple	1 proposition	(3-a)
	PL	PL	simple	*n* states, same proposition	(3-b)
Eventive	PL	SG	complex	*n* events, the same 1 proposition	(5-a)
	PL	PL	complex	1 or *n* events / 1 or *n* propositions	(5-b)
Stative	PL	SG	complex	1 proposition	(6-a)
	PL	PL	complex	1 or *n* propositions	(6-b)

In (6-b), some complainants might believe that the ads were irresponsible, others that the ads could encourage emulation by children, and others both of these things. In contrast, in (6-a), where we have *belief* as a singular noun, all of the complainants believe the same thing, namely, that the ads were irresponsible and could encourage emulation by children. We summarise these observations in Table 1.

(6) a. We did not agree with the complainants' **belief** that the ads were irresponsible and could encourage emulation by children

b. We did not agree with the complainants' **beliefs** that the ads were irresponsible and could encourage emulation by children [UKWaC]

3 Analysis. In the full paper, we use Schmitt's [8] theory for a type of generalised mereological sum operation that applies to e.g., propositions and eventualities. In order to model how what counts as one proposition can vary across contexts, we use Sutton & Filip's [9] notion of a context indexed individuation schema that applies to sets and returns maximally quantized subsets of entities that count as 'one' in that context and so can be arguments of cardinality functions. (See [4] for *quantized*. See, [5, 6] for a related idea in terms of disjointness.) However, we suppress details of that in this abstract. For eventive plural IONs, we allow for underspecification as to where the mereological *-operator applies indicated by $(*)$ in (10). The patterns in (4-6), we derive from lexical entries such as those in (7-10), and from the following assumptions: (i) as a property of STATES $\lambda s\, \mathit{belief}(s)$ is cumulative, but as a property of EVENTS $\lambda e\, \mathit{statement}(e)$ is not; (ii) common knowledge that experience of a token mental state cannot be shared (inherent distributivity), but agency of an EVENT can be (collectivity); (iii) common knowledge that contents of mental states can be shared; (iv) simple complement clauses fix the context to one in which the proposition denoted counts as 'one'. Complex complement clauses are compatible with the proposition denoted counting as 'one' or as 'more than one', modulo the context of evaluation. From our assumptions and (7-10), we derive the following:

(A) *Singular definite IONs with plural subjects and simple complements* (3-a, 4-a) denote a single proposition (that counts as one in that context), since $\mathit{contents}_c(s)$ is interpreted relative to a context indexed individuation schema, so the contents of states/events can only be drawn from a quantized set of propositions. For eventive IONs, reference is possible to the relevant event, since the set of events is quantized. For stative IONs, reference is not possible to the relevant state when the complement clause specifies only a single proposition, since the set of, e.g., belief states is not quantized.

(B) *Plural definite IONs with plural subjects and simple complements* (3-b, 4-b) cannot refer to pluralities of propositions, given (iv). EVENT IONs can refer to pluralities of events as licensed by e.g., $^*\mathit{statement}$ in (10). The only reading available for STATE IONs is to derive a quantized set of, e.g., belief states via anchoring each state to an Experiencer. See [2, 4], but especially [3].

(C) *Singular definite IONs with plural subjects and complex complements* (5-a, 6-a). Since $\mathit{contents}_c(s)$ is a quantized set, no sum of propositions and its proper parts can be in that set. This prevents multiple Agents/Experiencers being related to distinct propositions, and for the sum of these propositions to still count as 'one'. Hence, for both STATE and EVENT IONs, reference to only a single proposition is possible. For EVENT IONs, this is compatible with joint agency (ii) or multiple events with the same propositional contents. For STATE IONs, reference is to one proposition. Reference to different STATES is excluded since contents of beliefs can be shared (iii), and there is therefore no need to coerce a non-quantized set of e.g., belief states into a quantized one via anchoring to Experiencers.

(D) *Plural definite IONs with plural subjects and complex complements* (5-b, 6-b) can denote pluralities of propositions, licensed by, e.g., $^*\mathit{contents}_c(s)$. Eventive IONs can denote pluralities of events,

licensed by, e.g., $^{*}\mathit{statement}(s)$.

(7) $[\![\text{belief}]\!]^c = \lambda x\, \lambda s\, \lambda p\, [\mathit{belief}(s) \wedge \mathit{exp}(s)(x) \wedge \mathit{contents}_c(s)(p)]$

(8) $[\![\text{beliefs}]\!]^c = \lambda x\, \lambda s\, \lambda p\, [\mathit{belief}(s) \wedge \mathit{exp}(s)(x) \wedge {}^{*}\mathit{contents}_c(s)(p)]$

(9) $[\![\text{statement}]\!]^c = \lambda x\, \lambda e\, \lambda p\, [\mathit{statement}(e) \wedge \mathit{agent}(e)(x) \wedge \mathit{contents}_c(e)(p)]$

(10) $[\![\text{statements}]\!]^c = \lambda x\, \lambda e\, \lambda p\, [{}^{(*)}\mathit{statement}(e) \wedge \mathit{agent}(e)(x) \wedge {}^{(*)}\mathit{contents}_c(e)(p)]$

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