Vanilla rules: The "no ice cream" construction[1]

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Abstract. This paper is about what we call Deontically-flavored Nominal Constructions (DNCs) in English, such as *No ice cream* or *Dogs on leash only*. DNCs are often perceived as commands and have been argued to be a type of non-canonical imperative, much like root infinitives in German or Russian. We argue instead that DNCs at their core are declaratives that cite a rule but can be used performatively in the right context. We propose that DNCs contain an elided deontic modal, i.e., *allowed*, whose presence explains their distributional restrictions and interpretational properties. Among other things, we speculate on the licensing conditions of DNCs (the presence of *only* or the negative determiner *no*), suggesting that these are tied to the properties of discourses in which rules can be used naturally.

Keywords: deontic modality, ellipsis, normativity, performativity, speech acts.

1. Introduction

The proper analysis of imperatives is a matter of a long-standing debate in linguistics and philosophy, tied to a broader context of research on speech acts and clause typing (Charlow 2014; Harris 2022; Kaufmann 2012, 2020). More recently, there has been substantial interest in so-called 'non-canonical imperatives', which exhibit a mismatch between form and meaning such that, for example, a non-imperative clause has the illocutionary force of a directive speech act. In this paper, we focus on an English construction that seems to naturally fit this description, dubbing it Deontically-flavored Nominal Construction (DNC).[2] (1) illustrates.

(1) a. No ice cream!
b. No hazardous waste dumping!
c. Compost only!
d. Electrical vehicle charging only!

None of (1a)–(1d) has the morphological markings of an imperative, yet the overall interpretation resembles that of a directive speech act or a statement with a priority modal (2).

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[2]Previous labels include 'general prohibitives' (Donovan 2020) and 'negation-licensed commands' (Iatridou 2021). We do not consider these labels accurate, hence the new term, which we hope will stick.

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(2) a. No ice cream!
≈ Don't consume ice cream here! / One shouldn't consume ice cream here.
b. Compost only!
≈ Don't deposit anything but compost here! / One should only deposit compost here.

As discussed in detail in Donovan (2020) and Iatridou (2021), DNCs have the following properties. First, they convey a sense of normativity even though there is no overt expression that would be responsible for it. Second, they require strictly nominal surface material, either ordinary nominal phrases (1a,c) or gerunds (1b,d). Finally, DNCs have strict licensing conditions and mostly occur with the negative determiner *no* (1a,b) or the focus-sensitive operator *only* (1c,d). Unless there is prosodic focus (3), 'bare' counterparts are out (4).

(3) Smoking on the BALCONY (only)! (adapted from Iatridou 2021: 542)

(4) a. No concealed weapons! / Concealed weapons only! / #Concealed weapons!
b. No walking in this area! / Walking only in this area! / #Walking in this area!

DNCs are common in, but not limited to, signs (Neale 2013), and our primary concern in this paper is their linguistic content. Our central claim is that normativity in DNCs is conventionally encoded via an elided deontic modal. We limit ourselves to English and will not discuss possible variation in the form and/or function of similar constructions across languages (Iatridou 2021; Pak, Portner, and Zanuttini 2022). We do not take nominal constructions of the form *Attention!* to be instances of DNCs (see discussion in the Appendix).

The paper proceeds as follows. In Section 2, we consider the speech acts performed by DNCs, arguing that DNCs do not always have directive force and therefore are not non-canonical imperatives (pace Donovan 2020; Iatridou 2021). In Section 3, we examine the internal structure and the overall semantics of DNCs. Capitalizing on parallels with overt deontic modals, we argue that DNCs are declaratives with an elided *allowed* whose primary semantic contribution is referencing a pre-existing rule (cf. Pak et al. 2022 on Italian and Korean). Section 4 concludes.

2. Speech acts with DNCs

What kinds of speech acts are performed by DNCs? The existing literature can be grouped into two camps: (i) the DESCRIPTIVE VIEW, advocated by Pak et al. (2022) for Italian and Korean, and (ii) the DIRECTIVE VIEW, advocated for English DNCs by Donovan (2020) and Iatridou (2021). Our own proposal falls squarely into the first camp; we argue that DNCs simply express vanilla rules. In this section, we motivate it by showing that DNCs pattern like declaratives with overt modals and unlike directives.

2.1. Not conventional directives

Donovan (2020) argues that, despite obvious syntactic differences with canonical imperatives, DNCs have a similar underlying semantics. More specifically, he assumes a Kaufmann-style modal operator at LF. This analysis predicts that DNCs would exhibit the functional heterogeneity of imperatives, contrary to fact. Let us unpack. Across languages, imperatives convey a range of directive speech acts (e.g., commands, requests, suggestions, permissions), along with some non-directive ones (Kaufmann 2012; Schmerling 1982). The imperatives-as-modals view captures this by allowing the operator to have a universal or an existential force as well

as different flavors depending on context. However, unlike true imperatives, while DNCs are natural as commands, they cannot be used as suggestions, as (5) and (6) illustrate.[3]

(5) ***Command.*** *Lifeguard, to people jumping into an area with rip currents:*

a. Don’t swim! [imperative]

b. No swimming! [DNC]

(6) ***Suggestion.*** *I have to swim, run and cycle to train for a triathlon. But since my time is limited on weekends, could you suggest which of these I could drop?*

a. Maybe don’t swim. [imperative]

b. #Maybe no swimming. [DNC]

According to Iatridou’s (2021) take on the directive view, DNCs are specialized for commands, much like nominal directives *Hands up!* (see Appendix). Under this view, DNCs are similar to root infinitives in adult speech, which tend to have a universal force and are used in orders, commands or instructions (in German, the modal force may change in the presence of certain modifiers or special intonation; see Gärtner 2014 and Kaufmann 2022). (7)–(8) illustrate the pattern for German and Russian.[4]

(7) *Order from a commanding officer:*

a. Einzeln reinkommen! [German]
single come.in.INF
‘Come in one at a time!’

b. Zaxoditj po odnomu! [Russian]
come.in.INF for single.M.DAT.SG
‘Come in one at a time!’

(8) *Instruction on a package of oats:*

a. Fünf Minuten kochen. [German]
five minute.PL cook.INF
‘Cook for five minutes.’

b. Gotovitj pjatj minut. [Russian]
cook.INF five minute.GEN.PL
‘Cook for five minutes.’

In what follows, we will argue against the directive view of DNCs, drawing in particular on contrasts between DNCs and root infinitives.

[3]Note that the use in suggestions is constrained not only by modal force but also by modal flavor. The imperative operator has been argued to be a priority modal that typically admits a range of flavors (cf. Portner 2007: 135–141), while DNCs have a strictly deontic interpretation (see Section 3).

[4]Glosses: 1,2,3 person, ACC accusative, DAT dative, DEF definite, GEN genitive, F feminine, INF infinitive, M masculine, NEG negation, PL plural, PRS present, SG singular.

2.2. Not necessarily directives

The starting point of the directive view is the assumption that DNCs always perform (a subset of) directive speech acts, which in turn necessitates an analysis wherein the illocutionary force must come from somewhere in the structure. Below, we prove this assumption inaccurate. We show that DNCs are not always interpreted as directives to begin with. Overall, they pattern like declaratives with overt deontic and priority modals, or 'modalized declaratives' for short.

Directive speech acts, when performed by imperative clauses or root infinitives, have several distinctive features. These include the following: they cannot be evaluated for truth, require the speaker to behave as though the addressee will comply, typically indicate the speaker's endorsement of the prejacent's coming true, and cannot be modified by hedges. Modalized declaratives, when used descriptively as assertions and not performatively, behave the opposite way: they are truth-evaluable, are compatible with possible non-compliance, allow for the lack of endorsement, and can be modified by hedges.[5]

TRUTH-EVALUABILITY The content of directive speech acts is not easily evaluated for truth (Charlow 2014; Kaufmann 2012). As such, the possibility of explicit denials can be used as a one-way diagnostic of descriptive uses.[6] Constructions that only have performative uses ban denials, including imperatives in matrix clauses or root infinitives (9). DNCs and modalized declaratives allow them, which shows that such constructions can have descriptive uses (10).

(9) A: Don't smoke! [imperative]

A′: Nicht rauchen! [root infinitive; German]
NEG smoke.INF
'Don't smoke!'

B: #That's not true.

(10) A: No smoking here! [DNC]

A′: You shouldn't / aren't allowed to smoke here. [modal]

B: That's not true, this is not prohibited here. There are even ashtrays on the tables.

ADDRESSEE'S COMPLIANCE As discussed in detail in Kaufmann (2022) and Mandelkern (2019), directive speech acts, and especially commands, require the speaker to be an authority with respect to a salient decision problem and to expect the addressee to comply (we are not concerned here with the exact source of this constraint, its existence being enough to establish the empirical point). When this requirement is not met, we end up with what Mandelkern calls 'practical Moorean sentences' which defy the purpose of issuing a command—or, in some cases, with an optative reading (Kaufmann 2022). If DNCs were specialized for commands,

[5]Like Kaufmann (2012), we distinguish between descriptive and performative uses of modals, where the former changes the context by means of an assertion, and the latter issues an obligation or permission to the addressee by means of a directive speech act. When talking about performative content, we mean the content of such directive speech acts (cf. also Portner 2007: 137).

[6]This is not just at-issue content. Propositional anaphora targets a variety of contents, including implicatures (Snider 2017), but never exclusively performative content, such as the one conveyed by imperatives. That said, the infelicity of denials is not unique to performative content and also characterizes self-attributions (Korotkova 2016).

as Iatridou (2021) claims, we would expect the same pattern as with imperatives (11) and especially root infinitives (12). This prediction is not borne out as DNCs behave like modalized declaratives. That is, when used descriptively, they are compatible with the expectation of non-compliance (13).

(11) #Don’t smoke here! But I know that you will smoke anyway. [imperative]

(12) #Nicht rauchen! Aber ich weiß, daß du [root infinitive; German]
NEG smoke.INF but I know.1SG.PRS that you

sowieso rauchst.
anyway smoke.2SG.PRS
Intended: ‘Don’t smoke! But I know that you will smoke anyway.’

(13) a. No smoking here. But I know that you will smoke anyway. [DNC]
b. You shouldn’t / aren’t allowed to smoke here. But I know that you will. [modal]

SPEAKER’S ENDORSEMENT Broadly speaking, one of the properties of directive speech acts is that the speaker wishes the prejacent to come true and commits to a preference (Condoravdi and Lauer 2017; Starr 2020).[7] Again, we are not concerned here with the exact formalization of this intuition, given that obligatory endorsement is uncontroversial for commands. Iatridou’s (2021) analysis predicts that DNCs give rise to the same effect. Using the availability of disavowals as a diagnostic of endorsement, we show that this prediction is wrong. With command uses of imperatives and with root infinitives (see also discussion in Kaufmann 2022) endorsement is present and disavowals are infelicitous (14). DNCs, on the other hand, pattern like modalized declaratives and are compatible with disavowals of commitment (15).

(14) a. #Don’t smoke in this bar! But I don’t care if you do. [imperative]
b. #Nicht rauchen! Aber es ist mir egal, [root infinitive; German]
NEG smoke.INF but it be.3SG.PRS me equal

wenn du es tust.
if you it do.2SG.PRS
Intended: ‘Don’t smoke! But I don’t care if you do.’

(15) a. No smoking here. But I don’t care if you do. [DNC]
b. One shouldn’t / isn’t allowed to smoke here. But I don’t care if you do. [modal]

HEDGING Assertions, but not other speech acts (16), allow modification by declarative hedges, parenthetical constructions that signal the level of the speaker’s commitment to the asserted proposition (Bary and Maier 2021; Benton and van Elswyk 2020; Koev 2021; a.o.).[8] Again, DNCs pattern in this respect like modalized declaratives (18) and unlike imperatives and root infinitives (17), which shows that they can perform the speech act of assertion.

[7] One apparent exception comes from indifference and acquiescence uses (von Fintel and Iatridou 2017). However, as Condoravdi, Jarvis, and Jeong (2019) show, commitment to preference is present even in those cases.

[8] Notice that *non-declarative* hedges may target non-assertions (see, e.g., Haddican et al. 2014 on hedged polar and constituent questions).

(16) a. It's raining, I believe. [assertion]
b. #Is it raining, I believe. [question]
c. #Let it rain, I believe. [wish]

(17) a. #Don't smoke, I believe. [imperative]
b. #Nicht rauchen, glaube ich. [root infinitive; German]
NEG smoke.INF believe.1SG.PRS I
Intended: 'Don't smoke, I believe.'

(18) a. No smoking in this bar, I believe. [DNC]
b. You shouldn't / aren't allowed to smoke in this bar, I believe. [modal]

To recapitulate, the directive view maintains that DNCs always perform directive speech acts. We have demonstrated that this is not the case. DNCs pattern neither like commands (pace Iatridou 2021) nor like regular imperatives (pace Donovan 2020)—they behave like declaratives with overt modals. Like declaratives, they can perform assertions, which explains why they do not always meet conditions required for a directive speech act. The relevant empirical contrasts are summarized in Table 1.

	imperatives	root infinitives	DNCs	modalized declaratives
Possibility of truth-evaluability	no	no	yes	yes
Expected addressee's compliance	yes	yes	no	no
Obligatory speaker's endorsement	yes	yes	no	no
Possibility of hedging	no	no	yes	yes

Table 1: Constructions with a directive flavor

2.3. Sometimes directives

Despite our arguments against it, the directive view has some appeal precisely because DNCs *can* perform directive speech acts. However, they do so only in a performative context, one that satisfies the relevant felicity conditions. A minimal requirement for a DNC to function as a request is that the speaker is in a position of authority, otherwise the speech act, if meant as a request, will misfire. When used performatively, DNCs check all the boxes of a directive speech act. They are not truth-evaluable (19a) and cannot be modified by hedges (20). Also, the speaker endorses the outcome (19c) and expects the addressee to comply (19b).

(19) *Bar owner to a guest:* [AUTHORITY]
No smoking here!
a. *Guest, replying:* [TRUTH-EVALUABILITY]
#That's not true! There is no such rule here.
b. *Bar owner, following up:* [ADDRESSEE'S COMPLIANCE]
#But I know that you will anyway.
c. *Bar owner, following up:* [SPEAKER'S ENDORSEMENT]
#But I don't care if you do.

(20) *Bar owner to a guest:* [AUTHORITY, POSSIBILITY OF HEDGING]
#No smoking here, I think!

Donovan (2020) treats DNCs as hybrid constructions that incorporate both a directive component (due to the presence of an imperative operator) and an assertive component (due the embedded declarative clause). We maintain that the attested interpretational ambiguity is pragmatic and entirely expected if DNCs are underlyingly modalized declaratives. Deontic modals are well-known to have performative uses in performative contexts and descriptive uses elsewhere (Kaufmann 2012; Portner 2007). Thus, the declaratives in (21), when uttered by a person with authority, are undoubtedly requests and not statements.[9]

(21) *Bar owner to a guest*:
You shouldn't / may not / are not allowed to smoke here.

That modalized declaratives can perform a variety of directive speech acts has played an important role in the debate about the proper analysis of imperatives. We would like to sidestep this debate entirely and focus on the parallel between DNCs and declaratives with overt modals. Neither construction is specialized to perform directive speech acts, but each can in the right circumstances. This is compatible with a wide range of frameworks for directives, and whatever can be said about modalized declaratives can be said about DNCs. The next section develops a proposal that explains these facts by treating DNCs precisely as modalized declaratives.

3. Proposal

Here is the puzzle, again: DNCs only contain nominal material on the surface, yet they function like normative claims, down to directive uses. Is the normativity component a matter of pragmatic enrichment (cf. Pak et al. 2022; Reis 2003) or is it conventionally encoded (cf. Bhatt 2006; Gärtner 2014)? We will take the latter route and analyze DNCs as a case of ellipsis (22).

(22) a. No smoking. $= \neg$ [[$\exists$ smoking] ~~allowed~~]
b. Compost only. $=$ only [[$\exists$ [compost]$_F$] ~~allowed~~]

Our key motivation for ellipsis, rather than covert modality, is that DNCs have the same distribution and idiosyncrasies as the *X allowed* construction and it therefore makes sense to treat them along the same lines. We would like to emphasize that, despite several conceptual and implementational differences, our analysis owes much to that in Donovan (2020), which assumes the presence of *allowed* as well. Section 3.1 motivates each consequential part of our claims about the internal structure of DNCs, Section 3.2 spells out their formal semantics, and Section 3.3 discusses some of the effects of their rule-based interpretation.

3.1. Internal structure

Iatridou (2021) points out that DNCs could be just nominal constructions. We argue that DNCs must have propositional content. First, as (10) already demonstrates, DNCs allow propositional anaphora such as *That's not true* (or *That is surprising/frustrating*, etc.), and propositional anaphora needs propositional content. Second, as mentioned in the introduction, one of the licensors of DNCs is *only*. As von Fintel (1997) shows, *only* is an adverb of quantification, not a determiner, and functions as a propositional operator. For DNCs with gerunds, one could argue that *only* gets its proposition from the verb. But for truly nominal DNCs, such as *Compost only!*, we will have to postulate more structure. We aim for a unified analysis of both kinds

[9] As the reader can check, the pattern is the same as in (19)–(20).

of DNCs and therefore will assume from now on that all DNCs are propositional. The next question is what additional structure DNCs have, if any. We propose that they have an elided deontic modal (i.e., *allowed*) and argue for each step of this proposal below.

NORMATIVITY HARD-WIRED One could derive the normativity component of DNCs through pragmatic enrichment (cf. Reis 2003 on *wh*-infinitives in German). According to this view, DNCs are descriptive statements reinterpreted as rules, e.g., as in (23).[10]

(23) No smoking here. $\approx$ There is no smoking here. $\rightsquigarrow$ No smoking is allowed here.

There are two pieces of evidence against this view. First, as pointed out by Iatridou (2021), the normative flavor of DNCs is always there and their intended use as something other than describing a rule is infelicitous (24a), just like with overt normative modals (24b). The existential construction, on the other hand, is more flexible and allows a circumstantial reading (24c).

(24) a. #No whispering in this house as everybody is by nature loud.
b. #You shouldn't / must not whisper in this house as everybody is by nature loud.
c. There is no whispering in this house as everybody is by nature loud.
(based on Iatridou 2021: 539)

Second, if DNCs were non-modal statements, the unmodalized proposition should be available for anaphora. This is not what we find: anaphora can only target the normative claim, not the putative existential claim (25). This is in line with the behavior of deontics and root modals at large, which only make the modal claim available for anaphora but not the prejacent alone (Snider 2017).

(25) A: No smoking here.
B: That's not true.
(i) *that* = 'that there is such rule here' [normative claim]
(ii) *that* $\neq$ 'that there is no smoking here' [existential claim]

Together, the properties above strongly suggest the presence of a normative modal in DNCs.

MODAL FORCE Negative DNCs could in principle be analyzed as having a necessity or a possibility modal, with negation taking narrow or wide scope (respectively), as shown in (26).

(26) No compost!
$[\,\Box\,[\,\neg\,[\,\text{compost.present}\,]]] \approx [\,\neg\,[\,\Diamond\,[\,\text{compost.present}\,]]]$

Based on their behavior with *only*, we argue that DNCs in fact contain a possibility modal. Here is why. *Only* presupposes that its prejacent is true (Horn 1969; von Fintel 1997). Given that, assuming that *only* scopes above the modal, the presupposition with a necessity modal is too strong (27a). This is unlike the presupposition we get with a possibility modal, which seems intuitively correct (27b).[11]

[10] (23) is just a version of this view, and we argue specifically against the existential analysis below.
[11] As the reader can check for themselves, narrow-scope *only* yields incorrect presuppositions regardless of the modal force.

(27) Compost only.

a. $\approx$ [only [$\Box$ [compost.present]]] [necessity]
Presupposes: presence of compost required (not met if the receptacle is empty)

b. $\approx$ [only [$\Diamond$ [compost.present]]] [possibility]
Presupposes: presence of compost possible (met even if the receptacle is empty)

The fact that DNCs are interpreted as prohibitives ($\neg > \Diamond$), rather than permissions of negation ($\Diamond > \neg$), exhibits the standard split scope effect (Iatridou and Sichel 2011; Penka 2012). Negation in negative determiners usually scopes above certain possibility modals, including deontics (28). The same holds for *only* (29).

(28) No visitors are allowed after 8 pm. = It’s not allowed to have visitors after 8 pm.

(29) Only one item of luggage is allowed. = Taking more than one item isn’t allowed.

On its own, the narrow scope of negation is not possible, with DNCs or otherwise (30). This construal is only licensed in specific contexts (31), with the help of particles like *also* (Repp 2013). DNCs have a minimal surface structure, so such means of forcing the narrow scope of negation or *only* are not available. This explains why we only observe the split scope readings.

(30) No ice cream (allowed). $\neq$ It is allowed not to eat ice cream.

(31) *To a friend who doesn’t want to dress up at a Halloween party:*
No costume is also allowed. = It is also allowed not to wear a costume.

MODAL FLAVOR Normative modality comes in a variety of flavors, and it is common to talk about priority modals that have a wide range of uses including, but not limited to, deontic contexts (Portner 2007; Rubinstein 2012). We argue that DNCs constitute a case of deontic modality proper, bearing a striking resemblance to constructions with overt *be allowed*. Thus, both DNCs and *be allowed* are natural in contexts where the QUD is about rules (32).

(32) A: What are the rules in this park?
B: No littering, no barbecuing on the grass, no dog poop, … [DNCs]
B′: You are not allowed to litter, barbecue on the grass, leave dog poop, … [*be allowed*]

However, whereas most priority modals (*can, have to, need, should*) admit teleological and bouletic interpretations, DNCs and *be allowed* do not. The latter cannot answer QUDs about goals and lack the ‘compatibility with goals’ reading altogether (33). This also explains why, when used performatively, DNCs are bad as suggestions (6) or advice (pace Donovan 2020). Those uses are hallmarks of polyfunctional priority modals (including the imperative operator; Kaufmann 2012), and are not expected of a dedicated deontic modal.

(33) A: What is the best way to get to Stehekin?
B: You can only take the boat or walk. / You need to take the boat or walk.
B′: #Only taking the boat or walking.
B″: #You are only allowed to take the boat or walk.

DNCs and *be allowed* may receive what looks like a goal-oriented interpretation (34a,b), reminiscent of typical priority modals, which can have a teleological interpretation (34c).

(34) *Burglars in a house*: [context from Kratzer 1981]

a. No whispering (is allowed), or we will get caught.

b. In order not to get caught, no whispering (is allowed).

c. We shouldn't / cannot / may not whisper, or we will get caught.

Our claim is that the modal in (34a,b) is still deontic and refers to rules instantiated in order to meet some goal, along the lines of *Because we don't want to get caught, we created a new rule such that no whispering is allowed*. This is different from standard priority modals as in (34c), which simply indicate that no whispering is preferable if not getting caught is a mutually recognized goal.

ELLIPSIS VS. COVERT MODALITY We have established that DNCs contain a deontic possibility modal. The next question is how exactly this meaning is encoded, and there are at least two routes here. One is to postulate a covert modal operator at LF, as it has been done for many other constructions (Bhatt 2006; Gärtner 2014; Kaufmann 2012; Šimík 2010). Another is to postulate ellipsis of an actual modal. We opt for the latter solution, capitalizing primarily on the striking parallels between DNCs and the *X allowed* construction (note the absence of a copula).

But first, a note on the nature of ellipsis is in order. Many types of ellipsis, such as gapping or VP ellipsis, require a linguistic antecedent which is clearly not present with DNCs. However, there is another type of ellipsis that is sometimes referred to as 'constructional' ellipsis (Goldberg and Perek 2019; cf. also Hankamer and Sag's 1976 notion of 'deep anaphora'). In this latter variety the elided content must be easily recoverable from the context, as is the case with *Which floor?* on an elevator (Pranav Anand, p.c.) or question truncation of the form *Anybody want a cup of tea?* (Fitzpatrick 2006). This type of ellipsis is often conventionalized and limited to certain genres (cf. Goldberg and Perek's 2019 *Well, I never*). As mentioned in the introduction, DNCs are common on signs or other contexts where a deontic modal would be natural. As such, they are easily amenable to this construction-like analysis.

As discussed in Iatridou (2021), treating DNCs as elliptical immediately explains why they only have nominal remnants, since *allowed* requires nominal subjects. However, Iatridou further argues against ellipsis based on some discrepancies between DNCs and *X is/are allowed*. Capitalizing precisely on those discrepancies, we argue that DNCs inherit some idiosyncrasies from the *X allowed* construction and it therefore makes sense to analyze DNCs as elliptical.[12] First, DNCs allow both *of*-gerunds and ACC-gerunds (35). As Iatridou points out, reconstructing a full finite clause is possible with *of*-gerunds (36a) but not with ACC-gerunds (36b).

(35) DNCs: both types of gerunds OK

a. No touching of any surface! [*of*-gerund]

b. No touching any surface! [ACC-gerund]

(36) Overt copula: only *of*-gerunds OK

a. No touching of any surface is allowed. [*of*-gerund]

b. #No touching any surface is allowed. [ACC-gerund]

[12] It could be that the idiosyncrasies in question are somehow derived from the fact that we are dealing with deontic possibility in both cases (Hedde Zeijlstra, p.c.). At this stage, we consider the ellipsis route a simpler alternative.

Our point is that *allowed* (sans copula) is good in both cases (37). We are not offering an explanation of the contrast between (36) and (37), but simply use it as a rejoinder to Iatridou's objection to the idea of ellipsis resolution. We claim that resolution is possible, after all, but only if there is no overt copula present on the surface.

(37) *X allowed*: both types of gerunds types OK
   a. No touching of any surface allowed. [*of*-gerund]
   b. No touching any surface allowed. [ACC-gerund]

Second, DNCs and *X allowed* ban singular count nouns in the presence of *no* (38) (singular mass nouns are fine, as in *No ice cream*). Again, this is in contrast with the overt copula (39).

(38) a. #No dog (allowed) on the premises. / ✓No dogs (allowed) on the premises.
   b. No patron #allowed / ✓admitted without a tight fitting mask!

(39) a. No dog is allowed on the premises.
   b. No patron is allowed without a tight fitted mask.

Finally, DNCs and *X allowed* are non-embeddable unless under speech reports (40). The construction with an overt copula has no such restrictions (41).

(40) a. We said no smoking in the apartment after you torched the throw rug doing push-ups. (TV Series *How I Met Your Mother*, Season 5, Episode 11)
   b. #Mary knows that no smoking (allowed) here.
   c. #If no biking (allowed), I'm not coming.

(41) a. Mary knows that no smoking is allowed.
   b. If no biking is allowed, I'm not coming.

To sum up, there are several contrasts between DNCs and *X allowed*, on the one hand, and *X is allowed* with an overt copula, on the other. DNCs and *allowed* sans copula are compatible with *of*-gerunds and ACC-gerunds, ban singular count nouns and are generally not embeddable. We propose that the source of those restrictions is the same (albeit without explaining them) and therefore analyze DNCs as an instance of ellipsis.[13]

NO 'THERE IS' Before concluding, we would like to provide an argument against assimilating DNCs to existential *there*-constructions. Above we argued that DNCs cannot be simple

[13] Another piece of evidence in favor of the ellipsis analysis is the ambiguity of DNCs with non-deverbal nouns (42). A similar ambiguity is not found with gerunds due to the selectional restrictions of *available*, which requires physical objects (43).

(42) No ice cream.
   a. = No ice cream allowed (e.g., on public transit or in a museum).
   b. = No ice cream available (e.g., at a beach kiosk).

(43) No smoking.
   a. = No smoking allowed.
   b. ≠ *No smoking available.

An ellipsis analysis can easily handle the ambiguity in (42), the relevant reading being recoverable from the context. A covert modal analysis may also be possible, but it is not clear what kind of modal—and why—would be naturally ambiguous between a deontic (≈ allowed) and a dispositional (≈ available) flavor.

existential constructions since, unlike simple existentials (24c), they always have a normative flavor (24a). Donovan (2020) makes a more elaborate proposal and argues that DNCs have the underlying structure in (44), with two layers of ellipsis.

(44) No smoking. ≈ ~~There is~~ no smoking ~~allowed~~. (plus a silent imperative operator)

We argue that DNCs cannot be reduced to an existential construction, with or without a modal, because DNCs allow nominal phrases that cannot be pivots of existential *there*. In particular, DNCs with *only* allow generic bare plurals (45). The noun phrase in (45) is generic as it licenses the weak NPI *any*, and non-generic bare plurals, with or without *only*, do not (von Fintel 1997).

(45) Only students who have any siblings (allowed)! (based on von Fintel 1997: 23)

Existential *there* bans generic expressions (Milsark 1979), so (46) cannot be the source of (45).

(46) *There are only students who have any siblings allowed.

The bottom line is that there is no (elided) *there* in DNCs.[14]

We have argued that DNCs instantiate a case of constructional ellipsis, where (in most cases) the nominal remnant is associated with elided *allowed*. This account is motivated by the following properties of DNCs: (i) they have propositional content (based on propositional anaphora and *only*), (ii) they have a normative modal in their semantics (based on the obligatory normative flavor and on propositional anaphora), (iii) this is a possibility modal (based on interaction with *only*), (iv) this is a dedicated deontic modal (based on the lack of other readings typically associated with priority modals), and (v) this is an instance of ellipsis and not covert modality (based on parallels with the *X allowed* construction).

3.2. Formal semantics

Following Donovan (2020), we assume that *allowed* is the passive form of active *allow*, whereby, e.g., *Smoking or vaping in the office is allowed* is derivationally related to a transitive construction like *This company allows smoking or vaping in the office*. Importantly, we assume that the internal argument of *allow* (the only argument present in the passive counterpart) denotes a full-blown proposition, as visible from variants like *Mary allowed John to kiss her*.[15]

The cornerstone of our analysis of DNCs is (elided) *allowed*, which we treat as a regular existential deontic operator in the style of Kratzer (1991). For concreteness, we adopt the semantics in (48), where f_{circ} is a circumstantial modal base and g_{deon} is a deontic ordering source. The

[14]Donovan (2020: 12) provides a potential argument from tags for the presence of existential *there* in DNCs, citing examples as in (47). The argument is based on the assumption that tags match the TP material of their host clause (Culicover 1992).

(47) a. No smoking allowed! Actually, is there? / *are you? / *is it?
b. Three passengers only allowed in the cockpit! Actually, are there? / *are you? / *is it?

However, since here the putative tags are not directly attached to the DNC and instead appear in a follow-up clause, the force of this argument remains unclear.

[15]This last variant may be a ditransitive object-control construction or a transitive subject-to-object raising construction. If the former, one possibility is that the underlying structure of *allow* is always ditransitive, with the oblique object sometimes being a generic covert pronoun. For concreteness, we adopt the latter option here. For relevant discussion on whether deontics are raising or control predicates, see Bhatt (1998) and Wurmbrand (1999).

default anchoring for *allowed* is the time and world of evaluation. But this can be shifted by intensional operators, like *according to the law that comes into effect on Monday*.

(48) $[\![\text{allowed}]\!]^{\langle w,t\rangle}(p) = 1$ iff for some $\langle w',t'\rangle \in Best_{f_{circ},g_{deon},\langle w,t\rangle} : p(\langle w',t'\rangle) = 1$

Another important bit of our analysis is how to construct the prejacent proposition of *allowed*. We assume that it results from the nominal predicate composing with a covert existential operator. This is stated in (49).[16]

(49) $[\![\exists]\!]^{\langle w,t\rangle} = \lambda P$. for some $x : P_{\langle w,t\rangle}(x)$

For DNCs licensed by *no* we adopt the agreement approach to split scope of negative indefinites (Penka 2012). According to this approach, negative indefinites make an existential contribution locally and are licensed by higher negation, which takes scope above modal operators, like *allowed*. This is illustrated in (50).

(50) No ice cream.
   a. ¬ [[∃ ice cream] allowed]
   b. ≈ There are no circumstances among the deontically best options compatible with the current circumstances in which ice cream is present.

DNCs licensed by *only* have a parallel structure, with the complication that *only* associates with focus and triggers alternatives, which are factored into its exclusivity implication (Horn 1969; von Fintel 1997). We adopt the simple semantics for *only* in (51).

(51) a. $[\![\text{only}]\!]^{\langle w,t\rangle}(p)$ is defined just when $p(\langle w,t\rangle) = 1$.
   b. If defined, $[\![\text{only}]\!]^{\langle w,t\rangle}(p) = 1$ iff for all $q \in FocAlt(p) : q(\langle w,t\rangle) = 0$.

The semantics for DNCs with *only* now amounts to its intuitively correct meaning, as illustrated in (52).

(52) Compost only.
   a. only [[∃ [compost]$_F$] allowed]
   b. ≈ Given that compost is allowed, no compost-alternatives are allowed.

3.3. Rule-based interpretation

In this section we discuss three additional restrictions on DNCs, suggesting that they are all linked to the rule-based semantics.

FAITHFUL TO SOURCE There is a bit of behavior that distinguishes DNCs from standard deontic sentences. Consider a situation where the circumstances are such that A and B are in a bar and B picks up a cigarette, being about to light it. There is one relevant rule, which is that the bar prohibits smoking. Now consider the following as responses uttered by A.

(53) a. You shouldn't light that cigarette.
   b. You shouldn't smoke.

[16] A similar approach is discussed in Schwarz (2006) for intensional transitive verbs like *need*. While *need* takes DP-arguments on the surface, Schwarz argues that semantically it always combines with a proposition. One way of achieving this is through existential closure over the individual argument of a property-denoting expression.

(54) a. ??No lighting that cigarette.
b. No smoking.

According to the Kratzer-style modal semantics we suppose, (53a) is true. That is, all of the deontically best possibilities compatible with the circumstances are ones where B does not light the cigarette. (53b) is similarly true, modulo the content of the prejacent. Yet, however close the overt modal sentences (53a,b) are in meaning to the respective DNCs in (54a,b), only (54b) is perfectly felicitous. (54a) is decidedly odd, if not worse. The generalization seems to be that DNCs need to be faithful to the source rule. That is, utterances of DNCs seem most natural when citing an actual rule, as opposed to describing a proposition that would merely rank highly based on its comportment with the rules.

The following observations might point to an explanation. DNCs are often found on signs. Typically, when we encounter an utterance of an overt modal sentence, we presume that all manners of contextually salient circumstances could figure in the calculation of its circumstantial modal base. In contrast, when we encounter a sign, we interpret the pertaining utterance as less sensitive to the various particular features of the circumstances. In the example above, if (54b) were printed on a sign, it may be that the sign's presence in the bar is part of the circumstantial modal base, but not that A and B are there, nor that B is picking up a cigarette. This would make a few options available for explaining the oddness of (54a). It could be that the utterance would violate the maxim of relation. Or, perhaps it is just false, as would be the case if there are possibilities in $\bigcap f(\langle w,t\rangle)$ where B is presently somewhere where smoking is permitted, and therefore not all the best worlds rule out this behavior. While these observations pertain to DNCs printed on signs, it may be that spoken DNCs are no different in this regard and have a similarly impoverished modal base.

SIMILARITY TO I-LEVEL PREDICATES Another idiosyncrasy of DNCs is the kind of negation they are compatible with. As observed by Iatridou (2021), DNCs are not compatible with non-nominal negation, including *never*. This is illustrated in (55).

(55) a. *Never dogs.
b. *Never walking.

Intuitively, such examples are unacceptable because *never* quantifies over some sort of abstract entities (events, cases, situations, etc.) that draw relevant contrasts (Lewis 1975), and arguably DNCs do not make such entities available. Notice that the same idiosyncrasy holds for overt *allowed*. It is odd, if not entirely off, with *never* if meant to state a rule. This is shown in (56).

(56) A: What are the rules in this establishment?
B: ??Smoking (is) never allowed.

Our account does not currently predict this restriction, and we will not offer a full-throated explanation. Rather, we will content ourselves with drawing a suggestive parallel to individual-level predicates, which we think falls out from the rule-based story we have told so far.

The key observation is that individual-level predicates across the board are bad with temporal adverbials, including *never* (Czypionka and Lauer 2017).

(57) a. #Miles is never tall.

b. #My hair is never blue.

We speculate that such data may provide a clue for the negation licensing in DNCs. That is, according to several prominent accounts of individual-level predicates (cf. Chierchia 1995; Kratzer 1995), the behavior in (57) has to do with the unavailability of an abstract-entity argument that can be bound by *never*. The reason for this unavailability follows from the underlying semantics, i.e., individual-level predicates denote stable properties that do not change over time. In a similar way, DNCs may pattern with individual-level predicates in this regard simply because the former cite rules that remain stable across contexts. Furthermore, if *allowed*, which we postulate in DNCs, is in fact an adjectival, and not a verbal, passive, then we only expect it to behave like an individual-level predicate (Fernald 2000), which in turn will explain the data in (55) in a straightforward way. We hope to explore this hypothesis in future research.

NO BARE DNCS Here is a potential issue for our proposal. We do not exclude (58a), yet we do not find bare DNCs that express permissions simpliciter. In order to express such a meaning, *allowed* has to show up on the surface, as in (58b).

(58) a. #Smoking ~~allowed~~.

b. Smoking allowed.

This observation has led to the assumption that negation (Iatridou 2021) or exhaustification (Donovan 2020) is an integral part of the targeted construction. Here we want to consider a pragmatic solution, the key idea being that QUDs and focus structure have an effect on the licensing of DNCs.

We start with the following question: when is it felicitous to state a permission? Usually, this requires a situation in which there is uncertainty as to whether something is allowed or disallowed. Assuming that much, imagine the following situation, where what is at-issue is whether smoking is allowed.

(59) *Most, but not all, establishments have banned indoor smoking. We enter a pub, wondering whether smoking is allowed. After asking around, one of us says:*

a. Smoking IS allowed.

b. Smoking ALLOWED.

c. #Smoking.

The QUD in (59) requires verum focus or narrow focus on the predicate. This requirement can be satisfied in the presence of an overt auxiliary, as in (59a), or an overt modal, as in (59b). But since elided material cannot be focused, the minimal counterpart in (59c) is out. This could explain the lack of bare DNCs.

Even in the absence of a finite auxiliary or *allowed*, the situation changes for DNCs with locative or temporal modifiers, see (60).

(60) a. Smoking on the BALCONY! [=(3)]

b. Two-hour parking Monday through Friday. [common sign]

While these examples are fully acceptable, they can be plausibly assumed to be licensed by an EXH operator, a covert counterpart to *only* (Chierchia et al. 2012). The result is an exhaustivity effect. That is, (60a) means that smoking is allowed on the balcony and nowhere else, while (60b) allows parking only within the indicated time frame. In other words, the examples in (60) are not bare DNCs. They are essentially *only*-DNCs in disguise.

4. Conclusion

We have argued that DNCs in English are underlyingly modalized declaratives that contain an elided *allowed*. Their core semantic contribution is to invoke a pre-existing rule. Just like constructions with overt normative modals, DNCs can convey directive force in the right circumstances, but this effect is not hard-wired, unlike with true imperatives or with root infinitives in languages like German or Russian. We have also speculated that several idiosyncratic restrictions on the distribution of DNCs are intimately linked to their rule-based semantics and, crucially, are replicated with the overt *allowed* (but without the copula). We hope to further explore those restrictions in future research and to see whether our proposed analysis can be applied to similar constructions in other languages.

Appendix: Nominal directives

(61) exemplifies a construction that we dub 'nominal directives' (Iatridou 2021 considers this construction unproductive but we disagree).

(61) a. Attention!
b. Silence!
c. Water!
d. Hands up!
e. Keys in the basket!
f. Dogs on leash!

Nominal directives differ from DNCs in that they (unlike DNCs; see Section 2.2) always perform directive speech acts and cannot be used as mere assertions about rules. As such, nominal directives are not truth evaluable (62), they require the addressee's compliance (63) and the speaker's endorsement (64), and cannot be modified by declaratives hedges (65).

(62) A: Attention!
B: #That's not true.

(63) #Silence! But I know that you will keep talking anyway.

(64) #Attention! But I don't care if you don't listen.

(65) #Attention, I believe.

Fortmann (2018) argues that nominal directives with a directional modifier (61d–f) contain a covert verb of motion/location, as in (66), which in turn makes this an imperative construction:

(66) Dogs on leash! = Keep dogs on leash.

Likewise, German nominal directives are likely an instance of root infinitives:

(67) Hunde an der Leine ~~führen~~! [German]
dog.ACC.PL at DEF.F.DAT leash lead.INF
'(Lead) dogs on leash!'

Further support for the underlying structure in (67) comes from the fact that nominal directives (but not DNCs) license *mindestens* ‘at least’ (68). It requires the presence of a universal modal (Geurts and Nouwen 2007), and German RIs have been argued to contain a modal precisely of this sort (Gärtner 2014; Kaufmann 2022). Importantly for us here, nominal directives do not pattern like DNCs and hence are not discussed in the main body of the paper.

(68) Mindestens zwei Meter Abstand! [German]
at.least two meters distance
≈ ‘The distance must be at least two meters!’

References

Bary, C. and E. Maier (2021). The landscape of speech reporting. *Semantics & Pragmatics 14*(8), 1–54.

Benton, M. and P. van Elswyk (2020). Hedged assertion. In S. Goldberg (Ed.), *The Oxford Handbook of Assertion*. Oxford: Oxford University Press.

Bhatt, R. (1998). Obligation and possession. In H. Harley (Ed.), *Papers from the UPenn/MIT Roundtable on Argument Structure and Aspect, MITWPL 32*, pp. 21–40.

Bhatt, R. (2006). *Covert Modality in Non-finite Contexts*. Berlin / New York: Mouton de Gruyter.

Charlow, N. (2014). The meaning for imperatives. *Philosophy Compass 9*(8), 540–555.

Chierchia, G. (1995). Individual-level predicates as inherent generics. In G. N. Carlson and F. J. Pelletier (Eds.), *The Generic Book*, pp. 176–223. University of Chicago Press.

Chierchia, G., D. Fox, and B. Spector (2012). Scalar implicature as a grammatical phenomenon. In C. Maienborn, K. von Heusinger, and P. Portner (Eds.), *Semantics: An International Handbook of Natural Language Meaning*, pp. 2297–2331. Berlin/Boston: De Gruyter Mouton.

Condoravdi, C., R. Jarvis, and S. Jeong (2019). Endorsement of inconsistent imperatives. *Proceedings of the Linguistic Society of America 4*(1), 58.

Condoravdi, C. and S. Lauer (2017). Conditional imperatives and endorsement. In *Proceedings of NELS 47*.

Culicover, P. W. (1992). English tag questions in Universal Grammar. *Lingua 88*, 193–226.

Czypionka, A. and S. Lauer (2017). ‘#Tall this week’: experimental evidence for a false-implication account. Ms., University of Konstanz, version of September 19, 2017.

Donovan, M. (2020). General prohibition. Ms.

Fernald, T. B. (2000). *Predicates and temporal arguments*. Oxford: Oxford University Press.

von Fintel, K. (1997). Bare plurals, bare conditionals, and *only*. *Journal of Semantics 14*(1), 1–56.

von Fintel, K. and S. Iatridou (2017). A modest proposal for the meaning of imperatives. In *Modality Across Syntactic Categories*, pp. 288–319. Oxford: Oxford University Press.

Fitzpatrick, J. M. (2006). Deletion through movement. *Natural Language and Linguistic Theory 24*, 399–431.

Fortmann, C. (2018). Vermeintlich verblose Direktiva – stumme Prädikatsbildung in Wurzelstrukturen. In E. Fuß and A. Wöllstein (Eds.), *Grammatiktheorie und Grammatikographie*, pp. 63–92. Tübingen: Narr.

Gärtner, H. M. (2014). On covert modality in German root infinitives. In R. E. Santana-

LaBarge (Ed.), *Proceedings of the 31st West Coast Conference on Formal Linguistics (WCCFL)*, Somerville, MA, pp. 199–206. Cascadilla Proceedings Project.

Geurts, B. and R. Nouwen (2007). 'At least' et al.: The semantics of scalar modifiers. *Language 83*(3), 533–559.

Goldberg, A. E. and F. Perek (2019). Ellipsis in construction grammar. In J. van Craenenbroeck and T. Temmerman (Eds.), *The Oxford Handbook of Ellipsis*, pp. 188–204. Oxford: Oxford University Press.

Haddican, B., A. Holmberg, H. Tanaka, and G. Tsoulas (2014). Interrogative slifting in English. *Lingua 138*, 86–106.

Hankamer, J. and I. Sag (1976). Deep and surface anaphora. *Linguistic Inquiry 7*, 391–428.

Harris, D. W. (2022). Imperative inference and practical rationality. *Philosophical Studies 179*, 1065–1090.

Horn, L. (1969). A presuppositional analysis of *only* and *even*. In *Proceedings of Chicago Linguistic Society 5*, pp. 98–107.

Iatridou, S. (2021). Negation-licensed commands. *Linguistic Inquiry 52*(3), 519–549.

Iatridou, S. and I. Sichel (2011). Negative DPs, A-movement, and scope diminishment. *Linguistic Inquiry 42*(4), 595–629.

Kaufmann, M. (2012). *Interpreting imperatives*. Dordrecht/New York: Springer.

Kaufmann, M. (2020). Imperatives. In L. Matthewson, C. Meier, H. Rullman, and T. E. Zimmerman (Eds.), *Blackwell Companion to Semantics*, pp. 1–42. Oxford: Wiley.

Kaufmann, M. (2022). A compositional take on directive microvariation. Talk presented at SPAGAD lecture series, ZAS, Berlin.

Koev, T. (2021). Parentheticality, assertion strength, and polarity. *Linguistics and Philosophy 44*, 113–140.

Korotkova, N. (2016). Disagreement with evidentials: A call for subjectivity. In J. Hunter, M. Simons, and M. Stone (Eds.), *JerSem: The 20th Workshop on the Semantics and Pragmatics of Dialogue*, pp. 65–75.

Kratzer, A. (1981). The notional category of modality. In H.-J. Eikmeyer and H. Rieser (Eds.), *Words, Worlds, and Contexts*, pp. 38–74. Berlin: de Gruyter.

Kratzer, A. (1991). Modality. In A. von Stechow and D. Wunderlich (Eds.), *Semantik*, pp. 639 – 650. Berlin: De Gruyter.

Kratzer, A. (1995). Individual-level and stage-level predicates. In G. N. Carlson and F. J. Pelletier (Eds.), *The Generic Book*, pp. 125–175. University of Chicago Press.

Lewis, D. (1975). Adverbs of quantification. In E. Keenan (Ed.), *Formal Semantics of Natural Language*, pp. 3–15. Cambridge: Cambridge University Press.

Mandelkern, M. (2019). Practical Moore sentences. *Noûs 55*(1), 39–61.

Milsark, G. (1979). *Existential Sentences in English*. New York: Garland.

Neale, S. (2013). No parking. Talk presented at the workshop "New work on speech acts", Columbia University, New York, USA.

Pak, M., P. Portner, and R. Zanuttini (2022). Restrictions on indexicals in directive clauses. *Linguistic Inquiry*, 1–22.

Penka, D. (2012). Split scope of negative indefinites. *Language and Linguistics Compass 6/8*, 517–532.

Portner, P. (2007). Imperatives and modals. *Natural Language Semantics 15*(4), 351–383.

Reis, M. (2003). On the form and interpretation of German *Wh*-infinitives. *Journal of Germanic*

Linguistics 15(02), 155–201.

Repp, S. (2013). Common ground management: Modal particles, illocutionary negation and VERUM. In D. Gutzmann and H.-M. Gärtner (Eds.), *Beyond Expressives: Explorations in Use-Conditional Meaning*, pp. 231–274. Leiden: Brill.

Rubinstein, A. (2012). *Roots of Modality*. Ph. D. thesis, University of Massachusetts, Amherst.

Schmerling, S. (1982). How imperatives are special, and how they aren't. In *Papers from the Parasession on Nondeclaratives, Chicago Linguistics Society*, pp. 202–218.

Schwarz, F. (2006). On *needing* propositions and *looking for* properties. In *Semantics and Linguistic Theory*, Volume 16, pp. 259–276.

Snider, T. N. (2017). *Anaphoric reference to propositions*. Ph. D. thesis, Cornell University.

Starr, W. B. (2020). A preference semantics for imperatives. *Semantics and Pragmatics 13*(6), 1–60.

Šimík, R. (2010). *Modal existential* wh*-constructions*. Ph. D. thesis, University of Groningen.

Wurmbrand, S. (1999). Modal verbs must be raising verbs. In S. Bird, A. Carnie, J. D. Haugen, and P. Norquest (Eds.), *Proceedings of the 18th West Coast Conference on Formal Linguistics (WCCFL 18)*, Somerville, MA, pp. 599–612. Cascadilla Proceedings Project.