Temporal homogeneity and exceptions to habituals

Main Claims Time pronouns and non-quantificational frame adverbials denote definite pluralities of times. This explains two otherwise puzzling properties of English habitual sentences. First, bare (unquantified) habituals display **homogeneity effects** (Ferreira 2005). Second, they tolerate **exceptions** when those exceptions are irrelevant for the current Question Under Discussion.

We derive both homogeneity and exception tolerance from the same general pragmatic principles used to analyze plural definite descriptions, as in Križ (2016). The account requires no specialized habitual operator, though it is compatible with other work that does (e.g. Deo 2009). Homogeneity and exception tolerance are direct consequences of general features of the pragmatics of plurals.

Homogeneity English habitual sentences can be bare or quantified. Bare habituals may lack temporal adverbials, like *Annie smokes*, or they may contain temporal frame adverbials as in (1).

(1) a. Bonnie runs when it's sunny.
b. Connie calls her mother on Saturday.

Quantified habituals, as in (2), contain overt quantificational elements such as *always* or *every day*.

(2) a. Bonnie **always** runs when it's sunny.
b. Connie calls her mother on **every** Saturday.

The two classes come apart under negation. Negated bare habituals are not scopally ambiguous. In (3a), the negated habitual can only mean that Connie never calls her mother on Saturdays, so the followup is contradictory (#). Quantified habituals, on the other hand, have a reading on which negation scopes above the universal, as shown by the felicitous (✓) followups in (3b) and (3c).

(3) a. Connie doesn't call her mother on Saturday, # only every other Saturday.
b. Connie doesn't **always** call her mother on Saturday, ✓ only every other Saturday.
c. Connie doesn't call her mother **every** Saturday, ✓ only every other Saturday.

This is entirely parallel to the homogeneity effects found with plural definite descriptions as in (4).

(4) a. I didn't eat the cupcakes, # but I ate half of them.
b. I didn't eat **all** the cupcakes, ✓ but I ate half of them.

Analysis of Homogeneity I assume that sentences can have three truth values: true (1), false (0), and indeterminate ($\star$). As usual, time intervals are ordered by mereological parthood $\leq$ and precedence $\prec$, and we say that two intervals i and j **overlap** just in case they have a part in common. Intervals can be continuous (self-connected) or discontinuous pluralities (e.g. the sum of *9am to 10am* and *2pm to 3pm*). I assume that predicates of times are **homogeneous** in the sense of (5).

(5) **Definition: Temporal Homogeneity**
T is a **homogeneous** predicate of times if, whenever i and j overlap and $[\![T(i)]\!]^w = 1$, we have $[\![T(j)]\!]^w \neq 0$. (So, if $[\![T(i)]\!]^w = 1$ either $[\![T(j)]\!]^w = 1$ or $[\![T(j)]\!]^w = \star$.)

For a homogeneous predicate T (e.g. a sentence radical) the time intervals at which T is true must not overlap with the time intervals at which T is false. This is enough to derive the homogeneity effects observed in (3): If the predicate $[\![$Connie doesn't call her mother$]\!]^w$ is true of the interval $[\![$on Saturdays$]\!]^w$, then it must be either true (1) or indeterminate ($\star$) at every part of $[\![$on Saturdays$]\!]^w$. So, at any time i that lies within a Saturday, Connie does not call her mother at i.

The main contribution: Exception tolerance Bare habituals tolerate exceptions, as has been discussed in previous work (e.g. Deo 2009). For plural definites, Križ (2016) argues that exception tolerance and homogeneity have the same source, but this connection has not been made in the literature on habituals. However, the connection is clear: Bare habituals display both homogeneity and exception tolerance, and quantified habituals display neither. Moreover, changing the context changes the judgments about whether habitual sentences are acceptable, as shown in (6-7).

(6) *Context: Annie and Connie are late to school almost every day, but Bonnie's attendance is generally good. Bonnie comes to school on time about on most days, but a few times a month she is late. Annie says to Connie:*
Annie: Bonnie comes to school on time. **Implicit QUD:** Who is generally on time?

(7) *Context: Stickers are being given out for perfect attendance. Bonnie comes to school on time about on most days, but a few times a month she is late.*
Annie: # Bonnie comes to school on time. **Implicit QUD:** Who gets a sticker?

The key claim of this paper is that in both (6) and (7), Annie's assertion is indeterminate ($\star$). However, in (6), unlike (7), some $\star$-worlds in which Annie is mostly on time are in the same cell of the QUD-partition as the true-worlds, in which Bonnie is always on time. If the evaluation world is one of these $\star$-worlds, then the sentence is accepted as true for present purposes, or **true enough**.

Formally, exception tolerance is governed by the following pragmatic principle in (8).

(8) **Definition: Sufficient Truth** Križ (2016)
We write $\simeq_I$ for the equivalence relation that holds of two worlds u, v iff u and v are in the same cell of an issue I. A sentence S is **true enough** in world w with respect to I iff there is some world w' such that $[\![S]\!]^{w'} = 1$ (S is literally true in w') and $w \simeq_I w'$.

Temporal Homogeneity (5) predicts a trivalent meaning for habituals like (9), which (when indeterminate) can be repaired by Sufficient Truth. Let w^1, w^0, and $w^\star$ be worlds where (9) is respectively true, false, and indeterminate.

(9) On school days, Bonnie comes to school on time.
True in w iff Bonnie is on time on **all** school days in w. w^1
False in w iff Bonnie is on time on **no** school days in w. w^0
Indeterminate in w otherwise. $w^\star$

In Figure 1, let I^{lax} stand for the permissive QUD that groups some $\star$-worlds together with true-worlds, and let I^{strict} stand for the strict QUD that separates all true-worlds from all $\star$-worlds. Then $w^\star \simeq_{I^{\text{lax}}} w^1$, but $w^\star \not\simeq_{I^{\text{strict}}} w^1$. Thus, (9) is true enough in $w^\star$ with respect to I^{lax}, but not I^{strict}.

Conclusion and Extensions Homogeneity effects and exception tolerance in English bare habituals come as a package deal, and they can be analyzed together using independently-motivated pragmatic resources. In the full paper, we provide a compositional grammar fragment that derives the trivalent meanings required for the Sufficient Truth account. (The compositional semantics is omitted here for space reasons.) We also favorably compare the present proposal to previous accounts of exception tolerance in habituals. In particular, we consider examples in which discourse participants disagree on the QUD—producing dialogues that are difficult to analyze without QUD-sensitivity. Such examples further support the present approach. Finally, we take initial steps toward analyzing relative generics such as *Mosquitos carry malaria* along the same lines.

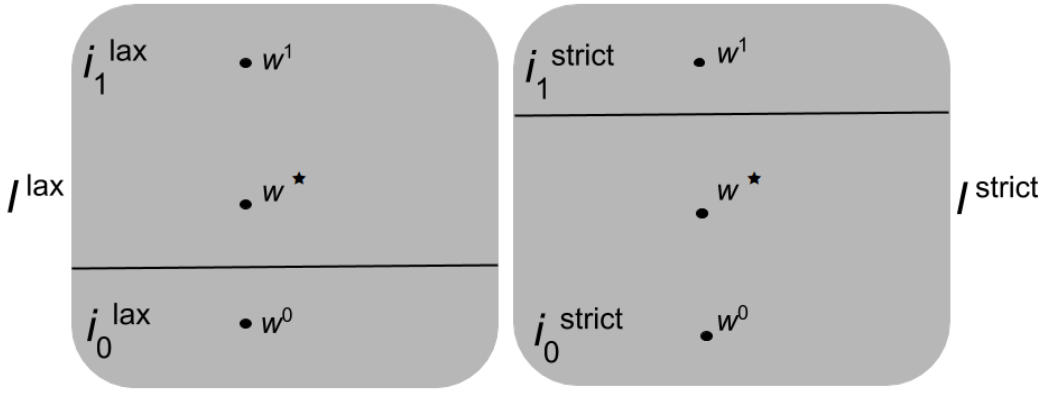

Figure 1 Is Bonnie generally on time?
$I^{\text{lax}} = \{i_1^{\text{lax}}, i_0^{\text{lax}}\}$ $\quad w^\star, w^1 \in i_1^{\text{lax}}$ $\quad w^0 \in i_0^{\text{lax}}$
Does Bonnie get a sticker for perfect attendance?
$I^{\text{strict}} = \{i_1^{\text{strict}}, i_0^{\text{strict}}\}$ $\quad w^1 \in i_1^{\text{strict}}$ $\quad w^\star, w^0 \in i_0^{\text{strict}}$

References

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