Counterfactual Donkeys: A Strict Conditional Analysis.

■ **Background.** (Indicative) donkey sentences have been analyzed in two main lines: (a) E-type theory and (b) dynamic semantics. In this paper, we combine (b) with a semantics for counterfactuals. There is a debate between a strict conditional and a variably strict conditional analysis for counterfactuals, where the variably strict line quantifies over the most similar antecedent worlds for each conditional, whereas the strict analysis quantifies over a set *f(w)* of worlds that expands throughout the discourse, the modal horizon (von Fintel 2001):

(1) $[\![\varphi > \psi]\!]^{\leq}(w) = 1$ iff $\forall w'$: $w' \in \max_{\leq,w}([\![\varphi]\!]^{\leq}) \rightarrow [\![\psi]\!]^{\leq}(w') = 1$ VAR. STRICT

(2) $[\![\varphi > \psi]\!]^{\leq}(w) = 1$ iff $\forall w' \in f(w)$: $[\![\varphi]\!]^{f,\leq}(w') = 1 \rightarrow [\![\psi]\!]^{f,\leq}(w') = 1$ STRICT

So far, counterfactual donkey sentences have only been analyzed in a variably strict framework (van Rooij 2006, Wang 2009). However, this analysis cannot account for the full range of data, esp. identificational donkeys and the licensing of NPI-*any* across all readings.

■ **The goal.** We propose a strict conditional analysis of counterfactual donkey sentences, preserving the insights from van Rooij (2006) while accounting for the full range of data. We will address a number of issues arising in previous analyses and present our own proposal.

■ **Previous analyses.** Van Rooij (2006) analyzes counterfactual donkey sentences by making the similarity relation ≤ sensitive to assignments, with a contextually given set X listing the unselectively bound variables ($\leq^X$): (3)-(7). (3)-(4) tell us that a pair $\langle v,h\rangle$ is closer than $\langle u,k\rangle$ to the actual $\langle w,g\rangle$ iff g and k coincide in the values assigned to the unselectively bound variables in X, and v is closer to w than u. Out of the set of pairs that make the antecedent true, $f^{*,X}_{\langle w,g\rangle}$ in (5) selects the ones that are closest to $\langle w,g\rangle$ according to (4). The sentence asserts that each such closest pair $\langle v,h\rangle$ is such that there is a variant of it $\langle v,k\rangle$ – with k matching h in the values of all the variable in X – making the consequent true.

(3) $h{\uparrow}^X = k{\uparrow}^X$ iff $\forall x \in X$: $h(x) = k(x)$

(4) $\langle v,h\rangle \leq^{*,X}_{\langle w,g\rangle} \langle u,k\rangle$ iff $h,k \supseteq g$, $h{\uparrow}^X = k{\uparrow}^X$, and $v \leq_w u$

(5) $f^{*,X}_{\langle w,g\rangle}(/\varphi/_g) = \{\langle v,h\rangle \in /\varphi/_g: \neg\exists\langle u,k\rangle \in /\varphi/_g: \langle u,k\rangle \leq^{*,X}_{\langle w,g\rangle} \langle v,h\rangle\}$

(6) $\langle v,h\rangle \sim^X \langle u,k\rangle$ iff $v = u$ and $h{\uparrow}^X = k{\uparrow}^X$

(7) $[\![\varphi >^X \psi]\!]^{\leq}(\langle w,g\rangle) = 1$ iff $\forall\langle v,h\rangle \in f^{*,X}_{\langle w,g\rangle}(/\varphi/_g)$: $\exists\langle u,k\rangle \in f^{*,X}_{\langle w,g\rangle}(/\varphi/_g)$: $\langle u,k\rangle \sim^X \langle v,h\rangle$ & $\langle u,k\rangle \in f^{*,X}_{\langle w,g\rangle}(/\psi/_g)$

This yields two treatments of indefinites: unselectively bound or 'high' indefinites, for which the equivalence $\exists xPx>Qx \equiv \forall x(Px>Qx)$ holds, and unbound or 'low' indefinites, for which the equivalence does not hold, illustrated in (8)-(9) respectively. Additionally, it captures weak readings of the donkey pronoun, as in (10).

(8) If John owned one of these$_{\{A,B\}}$ two donkeys, he would beat it.
=> If John owned donkey A, he would beat it, and if John owned donkey B, he would beat it.

(9) If one of these$_{\{A,B\}}$ animals had escaped, it would have been Alex the Tiger.
≠> If A had escaped, it would have been AtT, and if B had escaped it would have been AtT.

(10) If I had a dime, I would throw it into the meter.

However, there are three issues with this approach:

[1] Wang (2009) replies to van Rooij (2006) that it is not necessary to make the ordering ≤ sensitive to X. She claims that all readings can be derived in a system that amounts to always having X = ∅, i.e. as if all donkey indefinites were treated as low. The seemingly high reading in (8) would then be a special subcase of the low reading, arising when all assignments happen to be equally likely. The following example demonstrates that we need to derive a high reading even in cases where some assignments are clearly preferred to others. Consider sentence (12). On Wang's analysis, (12) only has a reading (12b), which comes out as true in a scenario like (11), because it only quantifies over a world-assignment pair in which Donkophobus is the farmer. However, we note that is also a second reading (12a) under which we judge (12) as false. Hence, ≤ needs to be sensitive to X as in van Rooij.

(11) *There are two farmers, both without donkeys. One of them, Donkophobus, likes beating donkeys and he has been saving money to buy one. He is only $5 short, because he missed a day of work. The other, Donkophilus, hates cruelty and has no means to obtain a donkey.*

(12) If a farmer owned a donkey, he would beat it.

a. High reading of *a farmer*: "If Donkophobus owned a donkey, he would beat it, and if Donkophilus owned a donkey, he would beat it." FALSE in (11)

b. Low reading of *a farmer*: "If one of the two owned a donkey, he would beat it (... because it would be Donkophobus)." TRUE in (11)

[2] While not discarding other possible solutions, van Rooij aims at deriving identificational donkey sentences like (9) from the apparatus (3)-(7). We note that two problems arise with the treatment of the pronoun as a donkey pronoun using (3)-(7): (9) is wrongly predicted to allow for a weak reading of the pronoun (as "one of the escaped animals") in contexts where uniqueness is not guaranteed, such as (13); and such treatment fails to explain the invariably neuter form of the pronoun in identificational sentences, as the contrast *it/*she* in (14) shows.

(13) *The gate of the lions was left open. Alex the Lion and Tara the Lioness are the most curious among the lions, tempering always with the gates. They always go together.*

(14) If John had kissed a girl from his class, it / *she would have been Sue.

[3] van Rooij proposes to explain the licensing of NPI-*any* in the antecedent of counterfactual donkey sentences by combining his analysis with a widening account (Kadmon and Landman 1993). He gives examples of high indefinites headed with *any* and shows that licensing goes through (given the equivalence $\exists x Px > Qx \equiv \forall x (Px > Qx)$). However, we note that NPI *any* can also head low indefinites, witness (15). Here the widening account does not go through: that the closest world w' where John kissed someone out of {a,b,c} makes the consequent clause true does not entail that the closest world w' where John kissed someone out of {a,b} does.

(15) a. If John had kissed any girl from his class, it would have been Sue.

b. If I had any dime in my pocket, I would throw it into the meter.

■ **Proposal.** We vindicate van Rooij's assignment-sensitive ordering $\leq^X$, we treat invariable neuter pronouns in identificational examples as concealed questions ranging over <s,e> functions (Romero 2005), and we combine van Rooij's treatment of donkey quantification with a strict conditional analysis of counterfactual conditionals (von Fintel 2001), as spelled out in (16)-(17). This last move has two consequences: First, NPIs are now licensed both in high *and* low donkeys, since the antecedent clause φ serves directly as the left argument – the restrictor – of universal quantification in (17). Second, this changes our notion of the modal horizon: while in von Fintel it provides a world with a sphere of accessible worlds, it now provides a world-assignment pair with a sphere of accessible such pairs. This sphere is subject to discourse constraints: it can expand, as in the Sobel sequence (18), but not contract (the reverse order of (18) is #). Interestingly our analysis predicts that, in a Sobel sequence involving a high indefinite in the first sentence (*a farmer* in (18)), the second sentence can contain a donkey pronoun *he* (underlined in (18)) picking up the referents introduced by the indefinite in the first sentence, since the modal horizon, as updated after the first sentence, already contains a pair of the form $\langle w', g^{d/1} \rangle$ for each farmer d. This prediction is borne out.

(16) $f\,|\varphi >^X \psi|_g = \lambda\langle w,g\rangle.\ f(\langle w,g\rangle) \cup \{ \langle v,h\rangle : \forall \langle u,k\rangle \in |\varphi|^{\leq}_g : \langle v,h\rangle \leq^X_{\langle w,g\rangle} \langle u,k\rangle \}$

(17) $|\varphi >^X \psi|^{f,\leq}_g = \{ \langle w,g\rangle : \forall \langle v,h\rangle \in f\,|\varphi >^X \psi|_g (\langle w,g\rangle)$: if $\langle v,h\rangle \in |\varphi|^{f,\leq}_g$ then $\exists \langle u,k\rangle \in |\varphi|^{f,\leq}_g : \langle u,k\rangle \sim^X \langle v,h\rangle \ \& \ \langle u,k\rangle \in |\psi|^{f,\leq}_g \}$

(18) (Let me tell you something about farmers.) If a farmer_1 owned a donkey, he_1 would beat it. But if a farmer (/ <u>he_1</u>) owned a donkey and the donkey was small, he_1 wouldn't.

Selected References von Fintel, K. 2001. Counterfactuals in a Dynamic Context. In Michael Kenstowicz (ed.), *Ken Hale: a life in language* ○ Romero, M. 2005. Concealed Questions and Specificational Subjects, *L&P* 28(6)○ van Rooij, R. 2006. Free Choice Counterfactual Donkeys. *JoSem* 23(4) ○ Wang, Y. 2009. Counterfactual Donkey Sentences. A Response to Robert van Rooij. *JoSem* 26(3)