An approach to Hurford Conditionals

Intro: Mandelkern & Romoli (2018) (henceforth MR) present the very interesting puzzle of so-called 'Hurford Conditionals' (HCs), arguing that none of the approaches to the parallel phenomenon of 'Hurford Disjunctions' (HDs) can account for the HC pattern. However, MR offer no solution to the puzzle. Our contribution is two-fold: **i)** We offer new data on HDs, showing that HDs with positive disjuncts **contrast** with HDs with negated disjuncts (contra Mandelkern & Romoli 2018 a.o.). **ii)** We present a novel notion of **super-redundancy** to capture this contrast, and show how this makes the HC pattern fall out.

Basic data: The classic observation behind HDs is that a disjunction is infelicitous when the two disjuncts stand in an entailment relationship. In (11) for instance, *John is in Paris* (p^+) entails *John is in France* (p). The order of the disjuncts doesn't seem to matter. Further, the judgment in the literature is that the same infelicity occurs with the negated versions of the two disjuncts, $\neg p \vee \neg p^+$, with $\neg p \models \neg p^+$, (7). Interestingly, if we take conditionals to have the material implication semantics, then we can construct conditionals that are semantically equivalent to HDs, via the well known *or-to-if* tautology ($\neg p \vee q \equiv p \rightarrow q$). Thus, (6) and (7) can be transformed to the semantically equivalent (8) and (9). However, (8) is judged to be infelicitous, but (9) is judged to be perfectly fine (see MR). Here's then the puzzle: how can a theory distinguish between (6) and (7), while at the same time not distinguish between (8) and (9), given their logical equivalence?

Negated HDs: Our answer to the puzzle is that no such theory is needed, because (6) and (7) should not be taken to be equally odd. In fact, as the paradigms in (10) - (15) show, the two types of disjunction contrast. What is needed then is a theory that can distinguish between HDs and Negated HDs.

Super-Redundancy: An intuitive account of HDs rests on the idea that they are redundant (Katzir & Singh 2013, Mayr & Romoli 2016). We are going to build on this, but we are going to make use of a novel notion of redundancy, dubbed **super-redundancy**. It is instructive to build up to super-redundancy by first defining a very simple notion of redundancy:

(1) $(\mathbf{S})^-_{\mathbf{C}}$: Given a complex sentence S that contains a sub-constituent $(C * \psi)$ or $(\psi * C)$, where $*$ is a binary connective, $(S)^-_C$ equals the version of S where $(C * \psi)/(\psi * C)$, has been replaced by ψ. If S is not a complex sentence, or contains no $(C * \psi)/(\psi * C)$ sub-constituent, then $(S)^-_C$ is undefined.

(2) A constituent C is **redundant** in a sentence S iff $(S)^-_C \equiv S$.

This simple notion doesn't work because it fails to differentiate between (6) and (7). The step from redundancy to super-redundancy passes through the following two notions, (3)-(4):

(3) Given a sentence S, a sub-constituent C of S, and sentence D: the *strengthening of C with D*, $Str(C, D)$, is defined as follows:

- If C is atomic, then $Str(C, D) = C \wedge D$
- If $C := \neg\alpha$, then $Str(C, D) = \neg Str(\alpha, D)$
- If $*$ is a binary connective, and $C := \alpha * \beta$, then $Str(C, D) = Str(\alpha, D) * Str(\beta, D)$

(4) $\mathbf{S_{Str(C,D)}}$: Given a complex sentence S that contains a sub-constituent $(C*\psi)$ or $(\psi*C)$, where $*$ is a binary connective, and given a sentence D, $\mathbf{S_{Str(C,D)}}$ equals the version of S where C has been replaced by $Str(C, D)$ in S. If S is not a complex sentence, or contains no $(C*\psi)/(\psi*C)$ sub-constituent, then $\mathbf{S_{Str(C,D)}}$ is undefined.

Finally, we define the notion of **super-redundancy**:

(5) A constituent C is **super-redundant** in a sentence S iff for all D, $(S)^-_C \equiv S_{Str(C,D)}$.

Intuitively, something is super-redundant iff no possible strengthening would make it non-redundant. If a constituent C is super-redundant in S, this leads to infelicity. We now apply the theory.

HDs: Consider a simple HD of the form $S = p^+ \vee p$. We argue that p^+ is super-redundant in S. $(S)^-_{p^+} = p$, $S_{Str(p^+,D)} = ((p^+ \wedge D) \vee p)$. We need to check whether for all D, $p \equiv ((p^+ \wedge D) \vee p)$. Take some arbitrary D, and suppose that p is true; then clearly, $((p^+ \wedge D) \vee p)$ is true. Now suppose that $((p^+ \wedge D) \vee p)$ is true. If it's true because p is true, then the result follows immediately. If it's true because $(p^+ \wedge D)$, then p^+ must be true (because $(p^+ \wedge D)$ is a conjunction). Since $p^+ \models p$, then p is true, so again the result follows.

Negated HDs: Consider a negated HD of the form $S = \neg p \vee \neg p^+$. We argue that S shows no kind of super-redundancy, i.e. it super-redundant for neither $\neg p$ nor $\neg p^+$. Note that $\neg p$ and $\neg p^+$ are the only licit candidates for super-redundancy, since by the definitions in (1) and (4), C must be immediately adjacent to a binary connective. The only other sub-constituents here are p and p^+, which are immediately adjacent to a negation, and not to the disjunction.

We start with $\neg p$. $(S)^-_{\neg p} = \neg p^+$, $S_{Str(\neg p,D)} = (\neg(p \wedge D)) \vee \neg p^+)$. We show that there is D such that $\neg p^+ \not\equiv (\neg(p \wedge D) \vee p^+)$. Take D to be a contradiction $\bot$. Then, $S_{Str(\neg p,\bot)} = (\neg(p\wedge \bot)) \vee p^+) = \neg p \vee \neg \bot \vee p^+ = \neg p \vee \top \vee p^+$, where $\top$ is a tautology. The last formula is equivalent to just $\top$. Clearly, $(S)^-_{\neg p} = \neg p^+$ is not equivalent to $S_{Str(\neg p,\bot)} = \top$.

Now consider $\neg p^+$. $(S)^-_{\neg p^+} = \neg p$, $S_{Str(\neg p^+,D)} = (\neg p \vee \neg(p^+ \wedge D))$. We show that there is D such that $\neg p \not\equiv (\neg p \vee \neg(p^+ \wedge D))$. Take D to be some tautology $\top$. Then, $S_{Str(\neg p^+,D)} = (\neg p \vee \neg(p^+ \wedge \top)) = (\neg p \vee \neg p^+)$. It's perfectly possible for $S_{Str(\neg p^+,D)}$ to be true, while $(S)^-_{\neg p^+}$ is false, e.g. in a case where $p = 1$ and $p^+ = 0$.

Thus, neither $\neg p$ nor $\neg p^+$ are super-redundant in S, so no infelicity arises.

HCs: Consider a HC or the form $S = (\neg p^+ \to p)$. We argue that $\neg p^+$ is super-redundant in S. $(S)^-_{\neg p^+} = p$, $S_{Str(\neg p^+,D)} = (\neg(p^+ \wedge D) \to p) = (\neg p^+ \vee \neg D) \to p$. We need to show that p and $(\neg p^+ \vee \neg D) \to p)$ are equivalent. Take some arbitrary D and assume that p is true; this automatically makes $(\neg p^+ \vee \neg D) \to p$ true. Now take $(\neg p^+ \vee \neg D) \to p$ to be true; in this case, either $p = 1$ (and the equivalence follows) or $(\neg p^+ \vee \neg D) = 0$. In the latter case, $p^+ = 1$ (since both disjuncts in $(\neg p^+ \vee \neg D)$ are false), and since $p^+ \models p$, then $p = 1$; so again the equivalence follows. Thus, $\neg p^+$ is super-redundant in S, and infelicity ensues.

Negated HCs: Consider a negated HC of the form $S = (p \to \neg p^+)$. Neither p nor $\neg p^+$ are super-redundant in S. Consider p first. $(S)^-_p = \neg p^+$, $S_{Str(p,D)} = (p \wedge D) \to \neg p^+$. Take $D =\bot$. Then, $S_{Str(p,D)} =\bot\to \neg p^+$, while $(S)^-_p = \neg p^+$. These are not equivalent, as no matter the truth value of $\neg p^+$, $\bot\to \neg p^+$ will be true. Hence p is not super-redundant in S.

Now consider $\neg p^+$. $(S)^-_{p^+} = p$, $S_{Str(\neg p^+,D)} = p \to \neg(p^+ \wedge D))$. Take $D = \top$. Then $S_{Str(\neg p^+,\top)} = p \to \neg p^+)$. p and $(p \to \neg p^+)$ are not equivalent: $(p \to \neg p^+)$ can be true because p is false. Therefore, no sub-constituent of S is super-redundant, and no infelicity arises.

Conclusion: HDs and negated HDs are not on par. Super-redundancy captures this, and leads to an immediate account of HCs. Our approach can be extended to other cases of HDs or quasi-HDs (discussed recently in Marty & Romoli 2022). More details on such extensions in the talk.

Linguistic Examples:

(6) **HD:** # John studied either in Paris or in France ($p^+ \vee p$, $p^+ \models p$)

(7) **Negated HD:** # John either didn't study in France or didn't study in Paris ($\neg p \vee \neg p^+$, $\neg p \models \neg p^+$; this example reports the MR judgment)

(8) **Hurford Conditional:** # If John is not in Paris, he is in France. ($\neg p^+ \rightarrow p$)

(9) **Negated Hurford Conditional:** ✓If John is in France, he's not in Paris. ($p \rightarrow \neg p^+$)

(10) a. ***Context:*** We go into John's office and see a full pack of Marlboro cigarettes in the dustbin. We are entertaining hypotheses about what's going on:
b. ✓John either doesn't smoke or he doesn't smoke Marlboros

(11) a. ***Context:*** We go into John's office and see a full pack of Marlboro cigarettes on his desk:
b. ✗John either smokes Marlboros or he smokes.

(12) a. ***Context:*** We're searching the house for John. We've checked most of the house, and we are almost done checking the basement, but we haven't found him:
b. ✓John either isn't in the house or isn't in the basement.

(13) a. ***Context:*** We're searching the house for John. He often likes to hide in the basement.
b. ✗John either is in the basement or in the house.

(14) a. ***Context:*** We are searching for John in France. We've spent three days in Paris and haven't found him yet. At the same time, we know that he rarely visits any other French cities.
b. ✓John either isn't in France or isn't in Paris.

(15) a. ***Context:*** We are searching for John, and we believe that he's in France. He often likes visiting Paris:
b. ✗John is either in Paris or in France.

References:

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Additional Info:

This submission has not been submitted elsewhere (either journal or conference).