Surprise-predicates, strong exhaustivity and *whether*-questions

INTRODUCTION. Certain attitude predicates, including factive emotive verbs like *surprise*, *disappoint* and *annoy*, are known to share two restrictions. First, when taking a wh-question (WhQ) as complement, they disallow the strongly exhaustive reading (Heim 1994, Sharvit 2002, Guerzoni and Sharvit 2007, a.o.). This is illustrated in (1)-(2): applying Ans_{STR} in (5) to the Karttunen-style denotation $[\![.]\!]_K$ in (3) wrongly predicts sentence (2) to be true in scenario (1), whereas applying Ans_{WK} in (4) yields the correct result. Second, these predicates do not embed alternative (AltQs) or polar questions (PolQs) (Grimshaw 1979, Lahiri 1991, a.o.): (6).

(1) Scenario: For everybody that actually called –e.g. a, b and c–, John expected them to call. But John also expected someone else to call –e.g. d– who in fact didn't call.

(2) It surprised John who called. ⇨ NOT TRUE in (1)

(3) $[\![$*who called*$]\!]_K$ = {a called, b called, c called}

(4) $Ans_{WK}(Q,w)) = \cap [\![Q]\!]_K(w)$ WEAKLY EXH. OPERATOR

(5) $Ans_{STR}(Q,w)) = \lambda w'\, [\, Ans_{WK}(Q,w) = Ans_{WK}(Q,w')\,]$ STRONGLY EXH. OPERATOR

(6) a. It surprised Mary *[whether $John_{L*H-}$ or $Bill_{H*L-}$ called] / *[whether John called].

GOAL. The goal of this paper is to point out serious shortcomings of recent approaches and to develop a new analysis that explains the above restrictions of *surprise*-predicates. We will do so by examining the semantics of these verbs with a declarative CP and transferring its ingredients –focus-sensitivity and presuppositions– to the cases with WhQ and AltQ/PosQ.

PREVIOUS ACCOUNTS. Guerzoni (2007) presents a unified account of *surprise*- and *realize*-verbs (which also show the two restrictions above), assuming that they are uniformly speaker-factive in that they presuppose that the speaker knows the complete answer to the embedded question. This, in conjunction with competition with the simpler declarative versions of the embedded clause, is shown to block (6) and to rule out strong exhaustivity. However, while speaker-factivity is well motivated for *realize*-verbs, as in (7), it is at best dubious for *surprise*-verbs, as in (8) (cf. Guerzoni (2007:8)). This means that, though a valid proposal exists for *realize*-verbs, the behaviour of *surprise*-verbs is not yet accounted for.

(7) I don't know who was at the party, but John has found out / #realized who was there.

(8) I don't know who was at the party, but it certainly surprised John who was there.

Nicolae (2013) proposes that strong exhaustivity and AltQs involve a null exhaustifying operator *only* within the question's IP. The two restrictions above then follow from the clash between *surprise*-verbs, which are said to be by and large Strawon-downward entailing, and the exhaustifiying operator, which is not allowed if leading to global weakening. However, this predicts that, while downward entailing preds (e.g. *be angry about*) do not embed AltQs, upward entailing preds (e.g. *be happy about*) should be able to. This is contrary to fact: (9).

(9) John is *angry / *happy about [$_{AltQ}$ whether Mary or Sue came to the party].

PROPOSAL. *Surprise* + declarative CP. Villalta (2008), building on Dretske (1975), shows that factive-emotive verbs like *surprise* are focus-sensitive: given (10), the same sentence is judged true –(11)– or not true –(12)– depending on the focus intonation, marked in capitals.

(10) Scenario: Lisa expected syntax to be taught by John, since he is the best syntactician around. Also, she expected syntax to be taught on Mondays, since that is the rule.

(11) It surprised Lisa [that John taught syntax on TUESdays] ~ C ⇨ TRUE in (10)

(12) It surprised Lisa [that JOHN taught syntax on Tuesdays] ~ C. ⇨ NOT TRUE in (10)

To derive focus sensitivity, Villalta adds to the Stalkaner-Heim-style lexical entry (13) (Stalnaker 1984, Heim 1992) an extra argument C, which must be a subset of the focus semantic value of the CP-complement, $[\![CP_{decl}]\!]^f$. This produces the at-issue content in (14a). Furthermore, Villalta conceives these verbs as degree constructions with C as the comparison class. Our rendition of this idea is given in (14a'), which (roughly) states that p reaches a degree d of unexpectedness for x that surpasses the threshold θ of the comparison class C (cf.

tall). Crucially, as in other degree construction like (15), the comparison class C must include the ordinary semantic value. This intuition is captured in the presupposition (14b).

(13) $[\![p\ surprises\ x]\!] = \lambda w_0.\ \forall w \in \cap Dox_x(w_0)\ [\ Sim_w(p) >_{Exp\_x(w0)} Sim_w(\neg p)\ ]$

(14) $[\![p\ surprises_C\ x]\!]$

a. Assertion: $\lambda w_0.\ \forall w \in \cap Dox_x(w_0): \forall q \in C\ [q \neq p \rightarrow [Sim_w(p) >_{Exp\_x(w0)} Sim_w(q)]]$

a'. Assertion: $\lambda w_0.\ \forall w \in \cap Dox_x(w_0): \exists d[Unexpected_{x,w0}(Sim_w(p),d) \wedge d > \theta(\{Sim_w(q):q \in C\})]$

b. Presupposition: $\lambda w_0.\ p \in C$

(15) a. Among the candidates, JOHN is the tallest. # if John is not one of the candidates.

b. Mia, a little girl / #teenager, watches violent movies for a 3-year old. (Schwarz 2010)

Surprise **+ WhQ.** Just like with *surprise*-verbs embedding a declarative CP, a *surprise*-verb embedding a WhQ has an additional argument C whose value is constrained by the $[\![.]\!]^f$ of some constituent down the tree. We assume that wh-phrases are inherently focus-marked and introduce a set of alternatives as their $[\![.]\!]^f$ (Beck 2006), that α~C requires that $C \subseteq [\![\alpha]\!]^f$ (Rooth 1992), and that the *Q*-operator takes the true propositions in the set of alternatives provided by its syntactic sister –here $[\![IP\sim C]\!]^f$–, turns them into a set and makes this set the ordinary value $[\![.]\!]^o$ of the WhQ. This gives us the partial semantic computation of (16) in (17), producing the Karttunen-style denotation (17d).

(16) [Ans **[$_{CP}$ *Q* [[$_{IP}$ who called]~C]]** surprised$_C$ John]

(17) a. $[\![who]\!]^o = \#$ a'. $[\![who]\!]^f = \{x_e$: x is human$\}$ $=_{e.g.}$ {r(alph), t(obi)}

b. $[\![who\ called]\!]^o = \#$ b'. $[\![who\ called]\!]^f =_{e.g.}$ {r called, t called}

c. $[\![[who\ called]\sim C]\!]^o = \#$ c'. $[\![[who\ called]\sim C]\!]^f = [\![who\ called]\!]^f$ if $C \subseteq [\![who\ called]\!]^f$; otherwise #.

d. $[\![Q\ IP\sim C]\!]^o = \lambda w_0.\lambda p.\ p \in [\![IP\sim C]\!]^f \wedge p(w_0)=1$ $=_{e.g.}$ $\lambda w_0.$\{t called\} d'. $[\![Q\ IP\sim C]\!]^f = \{[\![Q\ IP\sim C]\!]^o\}$

To continue with the computation of (16), some answer operator must be applied to (17d) before it can combine with *surprise* in (14). Crucially, if we apply Ans_{STR} in (5), the presupposition (14b) will not be satisfied: Ans_{STR}(*who called*,w_0) is the proposition "that t and nobody else called", which does not belong to (a subset C of) $[\![[_{IP}\ who\ called]]\!]^f$, i.e. to {r called, t called}. If we apply Ans_{WK} in (4) instead, the presupposition (14b) is satisfied: Ans_{WK}(*who called*,w_0) is the proposition "that t called", which belongs to the desired set {r called, t called}. [Similarly with Ans_{SOME}).] This derives the ban against strong exhaustivity.

Surprise **+ AltQ/PolQ.** Crucially, in AltQs and PolQs, the set of alternatives does not arise from an inherently focused phrase. Instead, it originates from the ordinary value of disjunction in AltQs and from the inherently disjunctive meaning of *whether* in PolQs, as shown in (18)-(19) for AltQs. This gives us the focus semantic value $[\![IP]\!]^f$ in (19b') and the following possible values for C: {{r called, t called}} or ∅. Now, no matter whether we apply Ans_{STR} or Ans_{WK} to (19d), the result –the propositions "that t and nobody else called" and "that t called" respectively– do not belong to any of those possible values of C. This makes AltQs and PolQs ill-suited under *surprise*-predicates, thus deriving the ban against them.

(18) * [Ans **[$_{CP}$ *whether* [[$_{IP}$ Ralph or Tobi called]~C]]** surprised$_C$ John]

(19) a. $[\![Ralph\ or\ Tobi]\!]^o = \{r, t\}$ a'. $[\![Ralph\ or\ Tobi]\!]^f = \{\ \{r, t\}\ \}$

b. $[\![IP]\!]^o$ = {s called, t called} b'. $[\![IP]\!]^f$ = { {s called, t called} }

c. $[\![IP\sim C]\!]^o = [\![IP]\!]^o$ if $C \subseteq [\![IP]\!]^f$; otherwise #. c'. $[\![IP\sim C]\!]^f = [\![IP]\!]^f$ if $C \subseteq [\![IP]\!]^f$; otherwise #.

d. $[\![Q\ IP\sim C]\!]^o = \lambda w_0.\lambda p.\ p \in [\![IP\sim C]\!]^o \wedge p(w_0)=1$ d'. $[\![Q\ IP\sim C]\!]^f = \{[\![Q\ IP\sim C]\!]^o\}$

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