A Rigidly Designating Operator "Upsilon" for Specificity of Proper Names, Indefinites, and E-Type Pronouns

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I propose an operator (Υ) ("upsilon") defined in terms of ($\forall$) (1) that introduces an instance of non-descriptional rigid designation (Kripke, 1980) (cf. "selection" with Hilbert's (ϵ)). A variable bound by (Υ) corresponds to (intended/speaker's) deictic reference to *this/that said/given one* and is basic to the grammar, encoding specificity in PNs, IDs, and ETPs. (Υ) meaning (personal) identity ("guise" (Heim, 1998)) is part of ($\exists$) in cognitive value; the other part is represented with an operator (Π) "physical embodiment". Identity is illustrated with statement (2).

(1) $\Upsilon x_i[x_i] \equiv \forall x[x$ is indexed as (is individual) i $\rightarrow \forall y[y$ is indexed as $i \leftrightarrow y = x]]$.

(2) 'Hesperus is Phosphorus'. $= x_H$ is x_P.

$\forall x[x$ is Hesp. $\rightarrow \forall y[y$ is Phos. $\leftrightarrow y = x]]$.
'Anything Hesp. is identical to anything Phos.'

(3) $\Pi x_i : \Upsilon x_i \equiv \exists x_i$

I propose assigning a *variable* index (VI) (Υx_i) to make an ID "specific" only within a discourse context (after (Heim, 1982))/scope of (Υ) ((x_i) pointing to a location/item in working memory) (cf. Abbott (2011): "specific" IDs are constant individual concepts). Thus, forms with VIs represent general claims. A *constant* index (e.g. Υx_C) means a speaker regards an ID like a PN, specific independent of context (cf. Burge (1973)). (Υ) vs. (Π) and their pairing (3) (a body with its "true" personal identity) help represent different readings of PARs, e.g. (4), intended by a reporter– call her "Mary". The problems Quine (1956) and Kaplan (1969) identity with quantifying into PARs are reduced when ambiguity in the interpretation of a variable (x) bound by ($\exists$) is reduced. Further, more readings than Quine (1956)'s "notional" (5) and "relational" (7) are possible. In (6) Mary presupposes Ralph (($\Pi_p x_R : \Upsilon x_R[x_R : x_R]$), shorthand: $[r]$) and asserts only that he represents a certain person. In (7), (y) is non-indexed, thus, *possibly* identical to (x_C) (cf. (y_D): mis-identification). In (8), Mary asserts that someone she identifies is the same one Ralph represents.

(4) Ralph believes that someone is a spy.

(5) $B(r, \Pi x_i : \Upsilon x_i[S(x_i : x_i)])$.
'Ralph believes that there are spies'.

(6) $B(r, \Pi x_C : \Upsilon x_C[S(x_C : x_C)])$.
'Ralph believes that a certain person is a spy'.

(7) $\Pi x_C : \Upsilon x_C.\Upsilon y[B(r, S(x_C : y))]$.
'There is a certain person. Ralph believes *of* said one that s/he is a spy'.

(8) $\Pi x_C : \Upsilon x_C[B(r, S(x_C : x_C))]$.
'There is a certain person. Ralph bel. said one is a spy'.

Superficially contradictory beliefs (after Kripke (1979)'s puzzle) such as Tom's belief that "composer" Paderewski but not "diplomat" Paderewski was musical may be represented (9) with distinct faulty guises private to Tom. (Υ) without (Π) represents intentional identity (Geach, 1967) without embodiment, as in reading (11) of (10).

(9) $\Pi_p x_P : \Upsilon x_P[B(t, \Upsilon x_C.\Upsilon x_D[M(x_P : x_C) \wedge \neg M(x_P : x_D)])]$.

(10) Hob thinks a witch bit Bob. Nob thinks she hit Cob.

(11) $\Upsilon x_D[T(h, Wx_D \wedge B(x_D, b)) \wedge T(n, (Wx_D \wedge) H(x_D, c))]$.

Descriptive approaches treat ETPs as meaning some attribute(s) (uniquely possessed). This is problematic because IDs need not be read "attributively" (Donnellan, 1966) in anaphora, e.g. Mary may intend *she* to mean *said person*, not *said witch* for Nob (11). Further, descriptive approaches fail to "[distinguish] participants" (Heim, 1990) (e.g., (12)); I claim (13) represents (12). I claim ETPs may be variables bound by some quantifiers when anaphoric with *enumerations* of *above zero* distinct identities; e.g. (15) represents (14) (after (Evans, 1977)). In contrast, *exactly n* also means (16). Thus, (17) would be contradictory (Kadmon, 1990). Other quantifiers allow "paycheck" pronouns that "re-quantify", e.g. (18). Last, (Υ) helps differentiate DS (19) readings: "weak"/"existential" (W/ER) (20) vs. "strong"/"universal" (S/UR) (21); I derive respective GQ truth conditions (TCs) (22) and (23). (Υ), not (Π), binds ETPs not "affirmatively embedded" (Heim, 1990).

(12) A bishop meets a bishop. He sanctifies him.

(13) $\exists x_i.\exists y_j[Bx_i \wedge M(x_i, y_j) \wedge By_j \wedge S(x_i, y_j)]$.
'A bishop meets a bishop. The former/this one sanctifies the latter/that one.'

(14) Gwen owns some/(n) sheep. Harry vexes them.

(15) $\exists a_1 \ldots \exists x_n[O(g, a_1 \ldots x_n) \wedge S(a_1 \ldots x_n) \wedge V(h, a_1 \ldots x_n)]$.
'Gwen owns a number (n) of (given/freely chosen) sheep. Harry vexes those/said (n) ones.'

(16) $\wedge|\{y : O(g, y)\} \cap S(z)| = n$.

(17) In fact, Gwen owns *other* sheep ($y_{n+1}, z_{n+2}, \ldots$).

(18) Most monks hunt, and ~~most monks~~ they fish, too.
(cf. most *of the* monks)
No monk hunts, nor does ~~any monk~~ he fish.

(19) Always, if a farmer owns a donkey, she beats it./
Every farmer {who/, if she} owns a donkey(,) beats it.

(20) Alw., $\Upsilon x_i.\Upsilon y_j[(Fx_i \wedge O(x_i, y_j) \wedge Dy_j) \rightarrow B(x_i, y_j)]$.

(21) Alw., $\Upsilon x_i[Fx_i \rightarrow \Upsilon y_j[(O(x_i, y_j) \wedge Dy_j) \rightarrow B(x_i, y_j)]]$.

(22) $(\{(x, y) : Fx \wedge Dy\} \cap O(z, a)) \subseteq B(g, h)$.

(23) $F(x) \subseteq \{y : (D(z) \cap \{a : O(y, a)\}) \subseteq \{g : B(y, g)\}\}$.

I propose a method of deriving GQ TCs of DS "bottom-up" from their declarative analogs. First, I observe that an ID may acquire the force of "free choice" *any* (after (Giannakidou, 2001)) when it is not "affirmatively embedded". For example, in imperative (24), the ID *a key* is ambiguous: either it may mean *a certain key* such that (25) represents (24), or it may mean the same as a "free choice description" (FCD) *any key* such that (26) represents (24). Due to the same ambiguity within conditionals, in (27) may mean (28) such that (29) represents both.

(24) Press a key to continue.

(25) $\exists x_C[K(x_C) \wedge$ (you ought to) press x_C to continue].

(26) $\Upsilon x_i[K(x_i) \wedge$ (you ought to) press x_i to continue].

(27) If [a farmer]$_i$ is gleeful, she$_i$ is happy.

(28) If [any farmer]$_i$ is gleeful, she$_i$ is happy.

(29) $\Upsilon x_i[(Fx_i \wedge Gx_i) \rightarrow Hx_i]$.

Using slightly elaborated FOL, I represent a declarative (30) as (32). As for the analogous conditional (31), assuming that both IDs are read as FCDs, I claim that (31) may be represented as either: (33a) that has the form of (20), or (34a) that has the form of (21). I take each of these as the starting point of a derivation of GQ TCs of (31). I derive the W/ER in (33) and the S/UR in (34) through stepwise applications of logical equivalences. These TCs are GQ-compatible in that the final main subsets and supersets (labeled as (P) and (Q) respectively) may be matched to quantifier denotations such as those given by Heim and Kratzer (1998) (after (Barwise and Cooper, 1981)), e.g. (35).

(30) A farmer owns a donkey. She beats it.

(31) If a farmer owns a donkey, she beats it.

(32) $\exists x_1.\exists a_2[|\{x_1\}| = 1 \wedge \{x_1\} \subseteq F(y) \wedge \{x_1\} \subseteq \{z : O(z, a_2)\} \wedge |\{a_2\}| = 1 \wedge \{a_2\} \subseteq D(b) \wedge \{x_1\} \subseteq \{c : B(c, a_2)\}]$.

(33) a. $\Upsilon x_1.\Upsilon a_2[(\{x_1\} \subseteq F(y) \wedge \{x_1\} \subseteq \{z : O(z, a_2)\} \wedge \{a_2\} \subseteq D(b)) \rightarrow \{x_1\} \subseteq \{c : B(c, a_2)\}]$.
b. $\Upsilon x_1.\Upsilon a_2[(\{(x_1, a_2)\} \subseteq \{(y, b) : Fy \wedge Db\} \wedge \{x_1\} \subseteq \{z : O(z, a_2)\}) \rightarrow \{x_1\} \subseteq \{c : B(c, a_2)\}]$.
c. $\Upsilon x_1.\Upsilon a_2[(\{(x_1, a_2)\} \subseteq \{(y, b) : Fy \wedge Db\} \wedge \{(x_1, a_2)\} \subseteq O(z, e)) \rightarrow \{x_1\} \subseteq \{c : B(c, a_2)\}]$.
d. $\Upsilon x_1.\Upsilon a_2[(\{(x_1, a_2)\} \subseteq \{(y, b) : Fy \wedge Db\} \wedge \{(x_1, a_2)\} \subseteq O(z, e)) \rightarrow \{(x_1, a_2)\} \subseteq B(c, g)]$.
e. $\Upsilon x_1.\Upsilon a_2[(\{(x_1, a_2)\} \subseteq (\{(y, b) : Fy \wedge Db\} \cap O(z, e)) \rightarrow \{(x_1, a_2)\} \subseteq B(c, g)]$.
f. $\Upsilon x_1.\Upsilon a_2[\{(x_1, a_2) : \{(x_1, a_2)\} \subseteq (\{(y, b) : Fy \wedge Db\} \cap O(z, e))\} \subseteq \{(x_1, a_2) : \{(x_1, a_2)\} \subseteq B(c, g)\}]$.
g. $(P :=)(\{(y, b) : Fy \wedge Db\} \cap O(z, e)) \subseteq B(c, g)(:= Q)$.

(34) a. $\Upsilon x_1.\Upsilon a_2[\{x_1\} \subseteq F(y) \rightarrow ((\{x_1\} \subseteq \{z : O(z, a_2)\} \wedge \{a_2\} \subseteq D(b)) \rightarrow \{x_1\} \subseteq \{c : B(c, a_2)\})]$.
b. $\Upsilon x_1.\Upsilon a_2[\{x_1 : \{x_1\} \subseteq F(y)\} \subseteq \{x_1 : (\{x_1\} \subseteq \{z : O(z, a_2)\} \wedge \{a_2\} \subseteq D(b)) \rightarrow \{x_1\} \subseteq \{c : B(c, a_2)\}\}]$.
c. $\Upsilon x_1.\Upsilon a_2[\{x_1 : \{x_1\} \subseteq F(y)\} \subseteq \{x_1 : (\{a_2\} \subseteq \{e : O(x_1, e)\} \wedge \{a_2\} \subseteq D(b)) \rightarrow \{x_1\} \subseteq \{c : B(c, a_2)\}\}]$.
d. $\Upsilon x_1.\Upsilon a_2[\{x_1 : \{x_1\} \subseteq F(y)\} \subseteq \{x_1 : (\{a_2\} \subseteq (\{e : O(x_1, e)\} \cap D(b)) \rightarrow \{x_1\} \subseteq \{c : B(c, a_2)\}\}]$.
e. $\Upsilon x_1.\Upsilon a_2[\{x_1 : \{x_1\} \subseteq F(y)\} \subseteq \{x_1 : (\{a_2\} \subseteq \{e : O(x_1, e)\} \cap D(b)) \rightarrow \{a_2\} \subseteq \{h : B(x_1, h)\}\}]$.
f. $\Upsilon x_1.\Upsilon a_2[\{x_1 : \{x_1\} \subseteq F(y)\} \subseteq \{x_1 : \{a_2 : \{a_2\} \subseteq \{e : O(x_1, e)\} \cap D(b))\} \subseteq \{a_2 : \{a_2\} \subseteq \{h : B(x_1, h)\}\}\}]$.
g. $\Upsilon x_1[\{x_1 : \{x_1\} \subseteq F(y)\} \subseteq \{x_1 : (\{e : O(x_1, e)\} \cap D(b))) \subseteq \{h : B(x_1, h)\}\}]$.
h. $\{g : \{g\} \subseteq F(y)\} \subseteq \{g : (\{e : O(g, e)\} \cap D(b))) \subseteq \{h : B(g, h)\}\}$.
i. $(P :=)F(y) \subseteq \{g : (\{e : O(g, e)\} \cap D(b))) \subseteq \{h : B(g, h)\}\}(:= Q)$.

(35) a. $[\![\textbf{every}]\!] = \lambda P_{<e,t>}.\lambda Q_{<e,t>}.\{x : P(x) = 1\} \subseteq \{y : Q(y) = 1\}$.
b. $[\![\textbf{some}]\!] = \lambda P_{<e,t>}.\lambda Q_{<e,t>}.\{x : P(x) = 1\} \cap \{y : Q(y) = 1\} \neq \varnothing$.

It is widely held that a conditional clause (CondC) variant of DS such as (31) is synonymous with a relative clause (RelC) variant (36) with the quantifier *every*. I motivate this synonymy with a derivation of the RelC variant from the CondC one using two "isomorphisms" of logical syntactic form. First, I posit that a CondC is isomorphic to the same CondC with a FCD or ID read as a FCD extracted leftward and replaced with a co-indexed pronoun (37). For example, (31) is isomorphic to (38). Second, I posit that a RelC is isomorphic to a CondC occupying the same position (39). I give a stepwise derivation from (31) to (36) in (40). This derivation helps explain how IDs may acquire universal force in conditionals (Heim, 1982).

(36) Every farmer $_{CP_{Rel}}$[who owns a donkey] beats it.

(37) $_{CP_{Cond}}$[If [any *F*]$_i$ is a *G*], she$_i$ is an *H*.
$\equiv$ [Any *F*]$_i$, $_{CP_{Cond}}$[if she$_i$ is a *G*], (she)$_i$ is an *H*.

(38) A farmer, $_{CP_{Cond}}$[if she owns a donkey], (she) beats it.

(39) [An *F*]$_i$ $_{CP_{Rel}}$[who$_i$ $_{IP}$[t_i is a *G*]] is an *H*.
$\equiv$ [An *F*]$_i$, $_{CP_{Cond}}$[if $_{IP}$[she$_i$ is a *G*]], is an *H*.

(40) a. (31)
b. If any farmer owns any donkey, she beats it. (cf. (28))
c. Any farmer, if she owns any donkey, (she) beats it. (via (37))
d. Every farmer, if she owns any donkey, (she) beats it.
e. Every farmer who owns any donkey beats it. (via (39))
f. (36) (cf. (28))