Quantifying over hidden (parts of) events

Marcin Wągiel

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Introduction

Non-trivial quantificational effects

▶ numerical frequency adjectives   (Dočekal & Wągiel 2018)

(1)   a.   two champions   ⇒ 2 individuals
      b.   two-time champion   ⇏ 2 individuals
      c.   two two-time champions

▶ multipliers   (Wągiel 2018, 2019, 2020)

(2)   a.   two murders   ⇒ 2 events
      b.   double murder   ⇏ 2 events
      c.   two double murders

Puzzle

Question

▶ what do the quantificational adjectives *two-time* and *double* quantify over?

Answer

▶ *two-time* quantifies over events of acquiring a role
▶ *double* quantifies over essential parts of an event

Consequences

▶ hidden (parts of) events
▶ roles as part of natural language ontology   (Zobel 2017)
▶ subatomic quantification in events   (Wągiel 2018)

Data: *two-time*

Entailment patterns

▶ event designated by the root of the deverbal noun

(3)   a.   Kim is a two-time Pulitzer Prize winner.
      b.   ⊨ Kim won Pulitzer Prize twice.

(4)   a.   Kim is a two-time cancer survivor.
      b.   ⊨ Kim survived cancer twice.

(5)   a.   Kim is a two-time Boston Marathon qualifier.
      b.   ⊨ Kim qualified for Boston Marathon twice.

Data: *two-time*

Hidden event

▶ becoming ⇒ act of acquiring a capacity

(6)   a.   Kim is a two-time champion.
      b.   ⊨ Kim became a champion twice.

(7)   a.   Kim is a two-time president.
      b.   ⊨ Kim became a president twice.

(8)   a.   Kim is a two-time captain for the Yellowjackets.
      b.   ⊨ Kim became a captain for the Yellowjackets twice.

Data: *double*

Entailment pattern

- ▶ hidden complex inner structure

(9) a. That crime was a double murder.
   b. ⊨ That crime consisted of two parts.

(10) a. That strike was a double kick.
    b. ⊨ That strike consisted of two parts.

(11) a. That play was a double play.
    b. ⊨ That play consisted of two parts.

Data: *double*

Analogy with individuals

- ▶ parts having a property comparable to that of a whole

(12) a. The Pschent is a double crown.
    b. ⊨ The Pschent consists of two parts.

(13) a. The Burgenator is a double burger.
    b. ⊨ The Burgenator consists of two parts.

(14) a. That weapon is a double shotgun.
    b. ⊨ That weapon consists of two parts.

Data: *two-time*

Scopal properties

▶ the meaning of *two-time* anchored to a particular entity
▶ no scopal ambiguities

(15) Kim and Ida met a two-time champion.

    (i)   Kim + Ida $\Rightarrow$ Champ$_{2015/2017}$

    (ii)   Kim $\Rightarrow$ Champ$_{2015/2017}$
           Ida $\Rightarrow$ Champ$_{1986/1989}$

    (iii) *Kim + Ida $\Rightarrow$ Champ$_{1998}$ + Champ$_{2003}$ UNAVAILABLE

    (iv) *Kim $\Rightarrow$ Champ$_{2003}$ UNAVAILABLE
          Ida $\Rightarrow$ Champ$_{1998}$

Data: *two-time*

Comparison with frequency adjectives
Stump (1981),Zimmermann(2003),Schäfer(2007),Gehrke&McNally(2015)

- ▶ no adverbial reading

(16) a. An occasional sailor strolled by.
     b. = Occasionally, a sailor strolled by.

(17) a. A two-time senator strolled by.
     b. $\neq$ Two times, a senator strolled by.

- ▶ only the internal reading

(18) a. A frequent sailor won the regatta.
     b. = Someone who sails frequently won the regatta.

(19) a. A two-time winner lost the regatta.
     b. = Someone who won two times lost the regatta.

Data: *double*

Scopal properties

- ▶ the meaning of *double* anchored to a particular event
- ▶ no scopal ambiguities

(20) Kim and Ida witnessed a double murder.
- (i)   Kim + Ida $\Rightarrow$ Murder$_{\text{Tom+Ben}}$
- (ii) Kim $\Rightarrow$ Murder$_{\text{Tom+Ben}}$
       Ida $\Rightarrow$ Murder$_{\text{Frank+Gus}}$
- (iii) *Kim + Ida $\Rightarrow$ Murder$_{\text{Steve}}$ + Murder$_{\text{Jack}}$ UNAVAILABLE
- (iv) *Kim $\Rightarrow$ Murder$_{\text{Steve}}$ UNAVAILABLE
       Ida $\Rightarrow$ Murder$_{\text{Jack}}$

Data: *two-time*

Distribution $\Rightarrow$ nouns denoting socially salient roles
COCA (Davies 2008) + Google

- ▶ award recipients

(21)   champion, winner, medalist, recipient

- ▶ competition participants

(22)   qualifier, nominee, loser, runner-up, finalist, performer

- ▶ positions with a term

(23)   president, governor, senator, prime minister, captain

- ▶ other socially salient capacities

(24)   husband, patient, survivor, felon

Data: *two-time*

Distributional constraints

- ▶ nouns denoting property that can be repetitively acquired
- ▶ the *became again* VP

(25) a.   Kim became a champion again.
      b.   Kim is a two-time champion.

(26) a. #Kim became a person again.
      b. #Kim is a two-time person.

(27) a. #Kim became a German again.
      b. #Kim is a two-time German.

Data: *two-time*

Distributional constraints

- ▶ socially salient functions

(28) a. ??Kim is a two-time birthday girl.
      b. ??Kim is a two-time designated driver.
      c. ??Kim is a two-time life of the party.

- ▶ conventionalization $\Rightarrow$ typically a ceremony

(29) a. two-time champion $\Rightarrow$ AWARDS CEREMONY
      b. two-time president $\Rightarrow$ ELECTIONS
      c. two-time husband $\Rightarrow$ WEDDING
      d. two-time patient $\Rightarrow$ HOSPITAL ADMISSION

Data: *double*

Distribution $\Rightarrow$ nouns denoting complex eventualities
COCA (Davies 2008) + Google

▶ actions affecting multiple objects

(30)   murder, homicide, date, play, punch

▶ actions involving quick repetitions

(31)   kick, jump, somersault, blink, lesson

▶ actions involving multiple aspects/consequences

(32)   victory, defeat, whammy

Data: *double*

Partitioning events
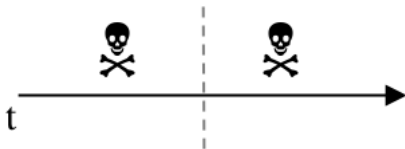
- ▶ temporal partitions

(33)   double murder

Figure 1: Knife stabbing

Data: *double*

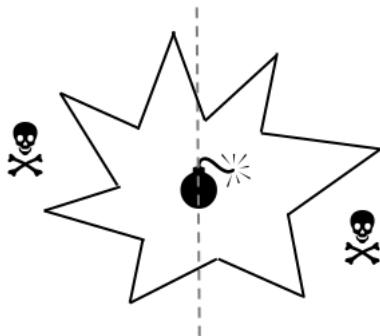Partitioning events

- ▶ spatial partitions

(34)   double murder

Figure 2: Bomb explosion

Data: *double*

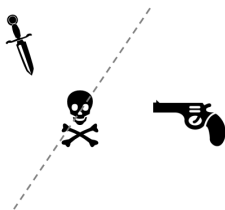Partitioning events

- other?

(35)   double murder

Figure 3: Two weapons, one victim

Background

Neo-Davidsonian framework
Carlson (1984), Dowty (1989), Parsons (1990)

- ▶ eventive nouns $\Rightarrow$ properties of events
- ▶ thematic relation BEN $\Rightarrow$ beneficiary

Quantification over events
Krifka (1989)

- ▶ counting $\Rightarrow$ measure functions
- ▶ extensive, additive, the Archimedean property

Numeral roots
Wągiel (2018, 2019), cf. Scha (1981), Rothstein (2017)

- ▶ names of number concepts
- ▶ type n

Proposal: *two-time*

Roles

Zobel (2017), cf. Sowa (1984), Steimann (2000)

▶ functions or capacities of individuals
▶ social constructs independent of their bearers

(36) a. Paul earns 3,000 euros as a judge.
      b. #Paul earns 3,000 euros as a man.

(37) a. The judge is on strike.
      b. The judge is the hangman.
      c. $\nvDash$ The hangman is on strike.

(38) a. The three core players and their organizations are
          executive director of the TCRPC.
      b. I long for the day when no one is head of the house.

Proposal: *two-time*

Roles

Zobel (2017), cf. Sowa (1984), Steimann (2000)

- ▶ primitive type r
- ▶ domain of roles D_r
- ▶ class nouns $\Rightarrow$ type $\langle e, t \rangle$
- ▶ role nouns $\Rightarrow$ type $\langle r, t \rangle$

(39)   a. $[\![\text{man}]\!] = \lambda x_e[\text{MAN}(x)]$
        b. $[\![\text{judge}]\!] = \lambda r_r[\text{JUDGE}(r)]$

Proposal: *two-time*

Operator BC (for 'become')

cf. Dowty (1979), Rappaport Hovav & Levin (1998)

- ▶ relates eventualities and roles ⇒ acquiring a role
- ▶ BEN relates an individual with an act of acquiring a role

Measure function $\#(\mathrm{BC})$

- ▶ quantification over 'becoming' eventualities

Presupposition $\mathrm{CONV}(P)$

- ▶ conventionalized, socially salient roles

(40) $\llbracket\text{-time}\rrbracket = \lambda n_n \lambda P_{\langle r,t\rangle:\mathrm{CONV}(P)} \lambda x_e \lambda r_r \exists e_v[\mathrm{BC}(e,r)$
$\wedge\ \mathrm{BEN}(e) = x \wedge P(r) \wedge \#(\mathrm{BC})(e) = n]$

Proposal: *two-time*

$$\exists r_r \exists e_v[\text{BC}(e, r) \land \text{BEN}(e) = k \land \text{CHAMPION}(r) \land \#(\text{BC})(e) = 2]$$

Kim
k

∃
$\lambda x_e \exists r_r \exists e_v[\text{BC}(e, r) \land \text{BEN}(e) = x \land \text{CHAMPION}(r) \land \#(\text{BC})(e) = 2]$

$\lambda P_{\langle r,t\rangle:\text{CONV}(P)} \lambda x_e \lambda r_r \exists e_v[\text{BC}(e, r) \land \text{BEN}(e) = x \land P(r) \land \#(\text{BC})(e) = 2]$

champion
$\lambda r_r[\text{CHAMPION}(r)]$

two
2

-time
$\lambda n_n \lambda P_{\langle r,t\rangle:\text{CONV}(P)} \lambda x_e \lambda r_r \exists e_v[\text{BC}(e, r) \land \text{BEN}(e) = x \land P(r) \land \#(\text{BC})(e) = n]$

Proposal: *double*

Essential parts
cf. Simons (1987)

- ▶ underspecified notion
- ▶ different conceptualizations under different circumstances

(41) For an atomic event e that has a property P,
e' is an essential part of e iff

   (i) e' is a part of e and

   (ii) e' is conceptualized as being essential for e to be
considered as having a property P.

Proposal: *double*

Essential parts

- ▶ typically self-sufficient ⇒ having property of the whole
- ▶ but not always

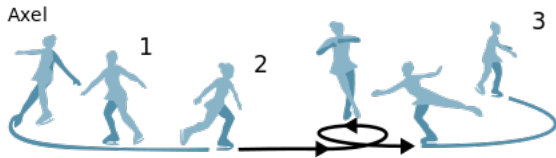(42)   a.   double axel
       b.   double somersault

Figure 4: Axel jump

Proposal: *double*

Quantification over essential parts of an event

- measure function $\#(P) \Rightarrow$ individuated events

(43) $\quad \forall P \forall e[\#(P)(e) = 1$ iff $\text{IND}(P)(e)]$

- measure function $\boxplus(P) \Rightarrow$ essential parts

(44) $\quad \forall P \forall e \forall e'[\text{if } \text{IND}(P)(e) \wedge e' \sqsubseteq e \wedge \text{ESNTL}(P)(e')$ then $\boxplus(P)(e) = \#(\text{ESNTL}(P)(e'))]$

(45) $\quad [\![\text{double}]\!] = \lambda P_{\langle v, t \rangle} \lambda e_v[P(e) \wedge \boxplus(P)(e) = 2]$

Proposal: *double*

$$\exists x_e \exists y_e [\text{MURDER}(tc) \land \text{AGENT}(tc) = y \land \text{THEME}(tc) = x \land \boxplus(\text{MURDER})(tc) = 2]$$

that crime
tc

$\lambda e_v \exists x_e \exists y_e [\text{MURDER}(e) \land \text{AGENT}(e) = y$
$\land \text{THEME}(e) = x \land \boxplus(\text{MURDER})(e) = 2]$

double
$\lambda P_{\langle v,t \rangle} \lambda e_v [P(e) \land \boxplus(P)(e) = 2]$

$\exists$
murder
$\lambda e_v \exists x_e \exists y_e [\text{MURDER}(e)$
$\land \text{AGENT}(e) = y$
$\land \text{THEME}(e) = x]$

Conclusion

Data

▶ understudied quantificational adjectives

(46) a. two-time champion
     b. double murder

Question

▶ what do the quantificational adjectives *two-time* and *double* quantify over?

Answer

▶ *two-time* quantifies over events of acquiring a role
▶ *double* quantifies over essential parts of an event

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Marcin Wągiel
marcin.wagiel@phil.muni.cz

Thanks!