Reference to and via properties: A cross-linguistic perspective[1]

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1 Achieving reference with adjectives

In formal semantic theories with roots in Montague Grammar, nouns and predicative adjectives are both assigned the semantic type $\langle e,t \rangle$: they denote properties of individuals. Thus, we would expect not only nouns but also adjectives to be available for reference, and indeed, in natural language, we sometimes do refer to entities using a property they manifest to identify them without an overt nominal 'core' (e.g., *the sick*, *the exotic*). Similarly, we sometimes refer to properties themselves or their concrete instances ('tropes', Moltmann 2004) using not only morphologically simple or derived nouns (e.g. *beauty*, *goodness*, *the sweetness of the strawberries*) but also adjectives (*the good*). Given that nouns and the objects they describe can be highly abstract (cf. expressions like *the good thing/aspect*), there is potential for cross-linguistic variation in how these different kinds of reference will work.

In this paper, we develop a cross-linguistic perspective on how unaccompanied adjectives achieve reference via properties to humans, reference via properties to abstract objects and reference to properties. The syntax-semantics interface is based on naturalistic data from Dutch, English, French, and Slovak, with some literature data from Greek, Romanian and German[2].

Section 2 lays out the data patterns for reference to human beings and reference to abstract objects, and presents the two main analyses developed in the literature. Section 3 zooms in on Dutch to show that things are more complicated than they seem at first sight, and Section 4 works out the cross-linguistic picture. Section 5 addresses the problem of reference to properties (the 'quality reading') across the languages under investigation. Section 6 concludes.

[2] The domain is a vast one, and there are many issues we cannot deal with in the limited space of this paper, including: 1) Nominalized uses of adjectives that are really homophonous with nouns (cf. Borer & Roy 2010; Alexiadou & Iordăchioaia 2013), e.g. *rouge* to refer to makeup, *the goods* to refer to commercial items. This has been argued to be word formation from a root, and as such unproductive, leading to an idiosyncratic meaning. 2) Nominalized uses of adjectives that are really instances of ellipsis, e.g. Dutch *een rode* ('a red (one)'); for discussion, see Sassoon (2013). 3) Pronouns modified by adjectives: Dutch *iets bijzonders* (lit. 'something special.GEN', Broekhuis et al. 2013), French *quelque chose d'intéressant* (lit. 'something of interesting'), English *something special*. These configurations are different from the ones we are interested in because they have an overt pronominal core.

2 Reference via properties

2.1 Reference to humans (the 'count reading')

Reference via properties to human beings is found in Dutch (Kester 1996; McNally & de Swart 2015), Greek (Giannakidou & Stavrou 1999), French (Lauwers 2008), Spanish (Villalba 2009, 2013; Villalba & Bartra-Kaufmann 2010), Hebrew/French (Borer & Roy 2010), Serbian (Arsenijević 2011), Italian (Marzo & Umbreit 2013), Greek/Romanian/German (Alexiadou & Iordăchioaia 2013), English (Quirk et al. 1985; Glass 2014), and Slovak (Richtarcikova 2014). Some examples:

(1) ***The creative*** *are more likely to be intrinsically (internally) motivated*.

                      (Glass 2014)

(2) ***I   plusii*** *sinithos ksexnun   apo   pu   ksekinisan*   [Greek]
the   rich   usually forget.3PL from where started.3PL
'The rich usually forget where they came from.'

(3) ***Een onschuldige*** *heeft   niets   te   vrezen.*   [Dutch]
a   innocent$_{+e}$ has   nothing to   fear[3]
'An innocent person has nothing to fear.'

(4) ***Tous   les   heureux*** *sont   riches.*   [French]
all   the.PL happy.PL are   rich.PL
'All happy people are rich.'

(5) *Radšej nech trpí **desať** **nevinných**,*   [Slovak]
Rather may suffer ten   innocent.PL
ako   by   jediný vinník unikol trestu
than would only   culprit escape punishment
'It's better for ten innocent people to suffer rather than for one guilty person go unpunished.'

English and Greek favor a definite plural generic reading (1-2)[4], while examples with a singular, generic or episodic reading, and with a range of determiners, appear in other languages (3-5). Adjectival and adverbial modification is heavily restricted in Greek (Giannakidou & Stavrou 1999), but quite free in other languages:

(6) a. *the extremely*$_{Adv}$ *rich*   b. *the   happy*$_{Adj}$ *rich*

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[3] The label [+e] in the gloss of the Dutch examples indicates adjective inflection. The short form of the adjective shows up with neuter nouns accompanied by the singular indefinite article; in all other cases, the long form (with schwa) must be used. The short form doubles as an adverb, so we use the presence or absence of schwa to distinguish adverbial and adjectival modification (see 19).

[4] Glass (2014) provides examples of non-generic readings for English.

(7) a. *de   zeer   rijken*   b. *twee zielige   zieken*   [Dutch]
         the   very$_{adv}$ rich$_{+en}$ two sorry$_{adj}$ sick$_{+en}$[5]

(8) a. *les   particulièrement   vulnérables*   [French]
         the   especially$_{adv}$ vulnerable.PL
     b. *les   infirmes   optimistes   et   joyeux*
         the   handicapped.PL   optimistic.PL   and   happy.PL

(9) a. *jedného   ťažko   chorého* b. *nesmelých   miestnych* [Slovak]
         one   seriously$_{adv}$ ill   shy.PL   local.PL

As reference to humans is compatible with adjectival and adverbial modifiers, it seems that both adjectival and nominal features underlie this construction.

2.2 Reference to inanimate or abstract objects (the 'mass reading')

Reference to inanimate or abstract objects has been discussed in the literature, usually with the observation that this is a rare and lexically restricted phenomenon in English. Glass (2014), however, reports the corpus data in (10). Examples from other languages are reported in (11)-(14):

(10) a. **The familiar** *is something dangerously wonderful.*
      b. *These items can range from the comical, to the messy, to* **the extremely dangerous**.

(11) *Polus   anthropus   tus   elkii   **to   agnosto**.*   [Greek]
      Many   people.ACC   them   attracts   the   unknown
      'Many people are attracted to the unknown.'

(12) (…) *en   een   memory stick   om   **al   dat   besprokene***
           and   a   memory stick   for   all   that.N   discussed$_{+e}$
      *en   **afgesprokene**   voor   mij   te   onthouden.*   [Dutch]
      and   agreed-upon$_{+e}$ for   me   to   remember
      (a job with serious meetings and serious words) 'and a memory stick to help me remember everything that was discussed and agreed upon.'

(13) *On   ne   rencontre   **ce   simple**   que   rarement,*
      one   NEG   encounters   this   simple   but   rarely
      et   au   petit   point   du   jour.   [French]
      and   at-the   small   point   of-the   day
      'One encounters this simplicity only rarely, and in the early morning.'

(14) **to   jediné   a   podstatne   nové**, *čo*
      that   unique   and   substantially$_{adv}$ new   what

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[5] The label [+en] in the gloss indicates adjective inflection (*-e*) plus plural marking (*-n*).

> *som   sa   dozvedel*   [Slovak]
> PART   REFL   found-out
> 'that unique and substantially new stuff that I learned'

Reference via properties to abstract objects has a limited productivity in Greek (Giannakidou & Stavrou 1999; Alexiadou & Iordăchioaia 2013), so we will leave Greek aside in the remainder of the paper. The construction is somewhat productive in English (Glass 2014), much more so in Dutch (McNally & de Swart 2015), as well as in French (Lauwers 2008) and Slovak (Richtarcikova 2014), so these are the languages we focus on for the cross-linguistic comparison. Before we do so, we introduce the two main lines of analysis that have been pursued in the literature.

2.3 Two analyses in the literature

The **null noun analysis** is a unified account of reference to humans and to abstract objects in terms of a null noun (*pro*), modified by an adjective (Kester 1996; Borer & Roy 2010). This leads to a structure like that in Figure 1 for e.g. *the rich* or *the familiar*. Differences between the human and the abstract object construction reside in features of the null noun (±human for Kester). The fact that A and N levels are visible in the structure accounts for modification by adjectives and adverbs.
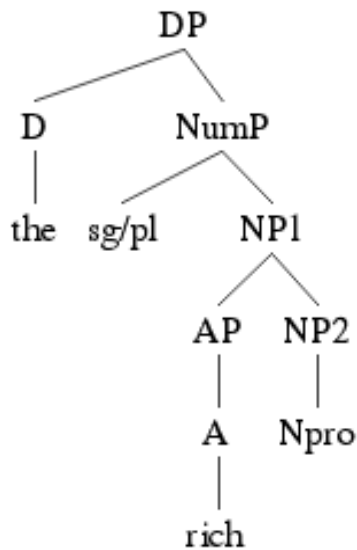

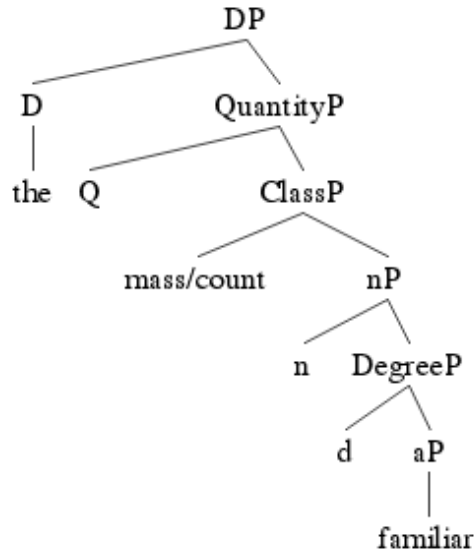Figure 1: Null noun analysis   Figure 2: Nominalization analysis

The **nominalization analysis** is a unified analysis of reference to humans and to abstract objects in terms of nominalization (Giannakidou & Stavrou 1999; Alexiadou & Iordăchioaia 2013; Sleeman 2013). One way to implement this, along the lines of Borer (2005), is to start from an uncategorized root embedded in an aP, which projects to DP through enrichment with functional information. Both *the rich* and *the familiar* thus result in the structure in Figure 2. Differences between the

human and the abstract object construction reside in ClassP: the count value of Class corresponds to the human construction; the mass value, to the abstract object construction. Just as in Figure 1, the presence of both A and N layers accounts for modification by adjectives and adverbs.

In contrast to such proposals, McNally & de Swart (2015) argue that there are too many differences between the human and abstract object constructions to support a unified analysis. We now turn to their arguments.

3 Differentiating human and abstract reference: The case from Dutch

3.1 Human reference

McNally & de Swart (2015) take as their starting point Kester (1996). Kester rejects a nominalization analysis for Dutch inflected adjectives with human reference because they do not allow for diminutive suffixes. The diminutive suffix –*je* is highly productive in Dutch, and can be tagged onto any count noun (15a-c):

(15)   a.   *een*   *vrouw*   –   *een*   *vrouwtje*
            a   woman   a   woman.DIM
       b.   *een*   *kleinigheid*   –   *een*   *kleinigheidje*
            a   small.ish.ness[6]   a   small.ish.ness.DIM
            'something small, of little value'
       c.   *een*   *dame*   –   *een*   *dametje*
            a   lady   a   lady.DIM
       d.   *een*   *blinde*   –   **een*   *blindetje*
            a   blind$_{[+e]}$ *a   blind$_{[+e]}$.DIM

The diminutive cannot be used with adjectives that refer to humans (15d), in contrast to count nouns morphologically derived from adjectives (15b).The problem is not phonological in nature, as regular count nouns ending in schwa use –*tje* to form diminutives (15c). Following Kester, McNally & de Swart (2015) posit a null noun analysis for human reference via properties. The derivation in (16) spells out the relation between the syntactic structure in Figure 1 and the semantics of *twee blinden* ('two blind$_{[+en]}$'). The null noun gets kind reference (16a) (Zamparelli 1995), and adjective inflection (-*e*) in NumP gives us the realizations of the kind (16d). The plural marker –*n* gets a Link (1983)-style semantics in (16e):

(16)   *twee blinden*
       two   blind$_{+en}$ 'two blind people'
       [$_{DP}$ *twee* [$_{NumP}$ –*e(n)* [$_{NP}$ *blind* [$_N$ *pro*]]]
   a. [[$_N$ *pro*]]: $\lambda x_k[\mathbf{human}(x_k)]$

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[6] Inspired by English *red-redness,* we gloss morphemes deriving nouns from adjectives as 'ness'.

b. $[[_{AP} \textit{blind}]]$: $\lambda P\lambda y[(\textbf{Blind}(P))(y)]$
c. $[[_{NP} \textit{blind} [_{N} \textit{pro}]]]$: $\lambda x_k[\textbf{Blind}_{[+human]}(x_k)]$
d. $[[_{NumP} -e]]$: $\lambda P\lambda y\exists x_k[\textbf{R}(y, x_k) \wedge P_{[+human]}(x_k)]$
e. $[[_{NumP} -en]]$: $\lambda P\lambda y\exists x_k[\textbf{R*}(y, x_k) \wedge P_{[+human]}(x_k)]$
f. $[[[_{NumP} -en [_{NP} \textit{blind pro}]]]]$: $\lambda y\exists x_k[\textbf{R*}(y, x_k) \wedge \textbf{Blind}_{[+human]}(x_k)]$
g. $[[[_{DP} \textit{twee} [_{NumP} -en [_{NP} \textit{blind pro}]]]]]$:
    $\exists y\exists x_k[\textbf{R*}(y, x_k) \wedge |y|=2 \wedge \textbf{Blind}_{[+human]}(x_k)]$

The argument in (15) is specific to Dutch, and Sleeman (2013) suggests that a nominalization analysis could explain the restriction on the diminutive suffix as a side effect of the nominal lacking a 'size' projection, as it involves a property turned into a kind. Alexiadou (2016) claims that the null noun analysis does not account for the difference in interpretation between the overt and covert nominal core in (17a), which is necessarily generic and restrictive, vs. (17b), which is not:

(17) a. *the clever*
      b. *the clever people*

The contrast in (17) (to the extent that it is robust, cf. footnote 4) is specific to English, as reference to humans in Dutch, French and Slovak can be both non-generic and generic. The kind-level interpretation of the null noun (in the null noun analysis) or the nP (in the nominalization analysis) ensures genericity (Giannakidou & Stavrou 1999). The restriction to the generic definite article in English and Greek follows from constraints on the extensionalization by NumP in (16d, e).

At an empirical level, we find little difference between the null noun and the nominalization analyses. Therefore, we will not focus on reference to humans via properties but rather will concern ourselves with reference via properties to abstract objects and reference to properties. First, we continue our investigation of Dutch.

3.2 Reference via properties to abstract objects

As we saw, Alexiadou (2016) rejects the null noun analysis for reference to humans. She argues that it does not account for reference to abstract objects either, as there is no obvious lexical counterpart to the null noun (see also Lauwers 2008), and the fact that the mass reading is neuter strongly suggests nominalization. According to McNally & de Swart (2015), neither a null noun nor nominalization explains reference to abstract objects in Dutch. The existing analyses face two problems.

First, neither analysis explains why the determiner used in reference to abstract objects is heavily restricted in Dutch. All mass quantifiers are excluded (18b), except for the pre-determiner *al* ('all') in (12) and (18a):

(18) a. (*al*)   *het*   *vreemde*   [Dutch]
          (all)   the.N   strange$_{[+e]}$
          'everything strange'

b. *een*   *beetje*   *onverschillige/*   *veel*   *moeilijke/*
   a   bit   indifferent[+e]/   much   difficult[+e]/
   weinig   *goede/*   *het*   *meeste*   *mooie*
   little   good[+e]/   the.N   most[+e]   beautiful[+e]
   Intended: a bit of indifference, much that is difficult, little that is
   good, most of what is beautiful

Data collection through Google searches yields only the neuter article *het* ('the.N') in (18a) and the demonstrative *dit/dat* ('this.N/that.N') in (12). Both the null noun and the nominalization analysis project an NP, so there should be no reason for determiner distribution to be constrained. Indeed, the Dutch human construction is compatible with definites, indefinites and quantifiers (Section 3.1).

Second, neither analysis explains why adverbial modification is productive, but adjectival modification is severely limited. The examples in (19) illustrate:

(19) a. *het*   *recent/*   **recente*   *besprokene*
        the.N   recent_adv/   recent[+e]adj   discussed
        'the   matters   recently   discussed'
     b. *het*   *moreel/*   **morele*   *goede*   *in*   *de*   *ander*
        the.N   moral_adv/   moral[+e]adj   good[+e]   in   the   other
        'the moral good in the other'

The long forms *recente* and *morele* are inflected adjectives. As adjective inflection (*-e*) is obligatory in Dutch after the definite article *het* (see footnote 3), the short forms *recent* and *moreel* must be adverbial. Google searches reveal that no regular descriptive adjective appears in the abstract object construction. But we find *enige* 'only_adj', *andere* 'other', *weinige* 'few_adj', and *vermeende* 'alleged':

(20)   (…)   **en**   **al**   **het**   **andere**   **leuke**   **in**   **het**   **leven**
             and   all   the   other[+e]   nice[+e]   in   the   life
       (a blog about eating, drinking, music, movies, soccer) 'and all the other nice things in life!

(21)   (…)   **het**   **vele**   **goede**   **van**   **de**   **dag**
             the   many[+e]   good[+e]   of   the   day
       (after which we happily got back into the bus, and completed the trip satisfied by) 'the many good things of the day.'

If the adjective projected an N at some level in its derivation, we would expect adjectival modification to be entirely free, and indeed, it is in the Dutch human construction (see Section 3.1). As neither the null noun nor the nominalization analysis accounts for the restrictions on determiners and adjectives, McNally & de Swart (2015) pursue a different approach. They defend an analysis of reference to abstract object in terms of a small clause that they assign a semantics similar to the

free relative 'that which is Adj'. The syntax is worked out in Figure 3, and the semantics in (22):
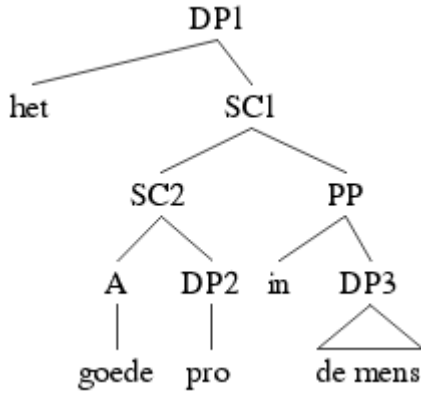

Figure 3: Small clause analysis

Instead of a null noun, the small clause analysis posits a null pronoun that the adjective predicates over; this captures the meaning 'that which is Adj'. The definite article *het* (or the demonstrative *dit/dat*) introduces closure over the open proposition. Its semantics in (22c) is Hinterwimmer's (2013) iota operator for free relatives. In addition, *het* provides a maximal sum interpretation which is compatible with pre-determiner *al* ('all'), but no other (mass) quantifiers.

(22)   *het goede   in de mens*
        the good[+e] in the human-being   'what is good in mankind'
   a.   [DP *het* [SC [Adj *goede*] [DP pro]][PP *in* [DP *de mens*]]]]
   b.   [[*goede pro*]]^g: $\lambda s[\mathbf{Good^*}(x_{[\text{-anim, -count}]})(s)]$
   c.   [[*het$_2$*]]$^g = \lambda P_{<e,<s,t>>} \lambda s \iota x[P(x_{[\text{-anim, -count}]})(s)]$
   d.   [[*goede in de mens*]]^g:
        $\lambda s[\mathbf{Good^*}(x_{[\text{-anim, -count}]})(s) \wedge \mathbf{In}(x_{[\text{-anim, -count}]}, \mathbf{mankind})(s)]$
   e.   [[*het$_2$ goede in de mens*]]^g:
        $\lambda s \iota x[\mathbf{Good^*}(x_{[\text{-anim, -count}]})(s) \wedge \mathbf{In}(x_{[\text{-anim, -count}]}, \mathbf{mankind})(s)]$

Under the small clause analysis, no NP is projected, so adjectival modification is restricted to adjectives that operate on the level of propositions, such as intensional adjectives (e.g. Larson 2002) or DP-internal *only* (e.g. McNally 2008).

McNally & de Swart (2015) conclude that the small clause analysis of reference to abstract objects via properties has a higher explanatory value than either a null noun analysis or a nominalization approach. But they work exclusively with Dutch data. Does their analysis have cross-linguistic validity? The small clause analysis makes strong predictions about determiner selection and restricted adjectival modification, which can easily be tested in other languages. Section 4 compares data from English, German, French, and Slovak to Dutch.

4 Reference to abstract objects: A cross-linguistic perspective

As it proves hard to construct good examples for controlled testing, Section 3 relied on naturalistic data from Dutch (from the Dutch SoNaR corpus, 500M words, and Google searches) that were tested against native speaker intuitions. We extend this approach to the other languages of investigation in this section. Besides literature examples, we use English data from the COCA and GLoWBE corpora (Davies

2008, 2013), and Slovak data from the Slovak National Corpus (806M words)[7]. We complement with German and French data from the literature and from Google.

4.1 Determiner restrictions

German is close to Dutch (see Section 3.2). It uses the neuter form of the definite article (23a), and it tolerates demonstratives and predeterminer *all* 'all' (23b):

(23) a. ***Das   sehr   Gute***   *ist   so   selten   wie   ein*
         the.N   very   good$_{[+e]}$ is   as   rare   as   a
         schwarzer   Diamant.   [German]
         black   diamond
         'The very good is as rare as a black diamond.'
      b. ***All   dieses   Gute***   *ist   nicht   selbstverständlich*.
         all   this.N   good$_{[+e]}$ is   not   obvious
         'All this good is not obvious.'

Thus, we find positive evidence for reference to abstract objects via properties in German. We find similar support in the other languages under investigation. Glass (2014) provides the data with definites such as (24a), and in our corpus investigations predeterminer *all* also turns up (24b):

(24) a. *Progress always seems to go in one direction-toward **the dead** and **the dull***.
      b. *l wish you **all the ill** in the world.*

French reference to abstract objects requires the masculine form of the definite article (25) (Lauwers 2008). Not surprisingly, examples with demonstratives (13) and predeterminer *tout* 'all' are attested as well (26):

(25) *Depuis   le   début   de   saison,   elle   alterne*
      Since   the   beginning   of   season   she   alternates
      le   bon *et* ***le   franchement   très   mauvais***. [French]
      the   good   and   the   frankly   very   bad
      'Since the beginning of the season, she alternates the good and the frankly very bad.'   Lauwers (2008)

(26) ***Tout   le   beau*** *de   la   passion   est   fini*.
      all   the   beautiful   of   the   passion   is   finished
      'All the beauty of the passion is finished.'

Lauwers (2008: 146) defines the denotation of *le beau* ('the beautiful') as all possible referents that have this property in common, that is 'what is beautiful'. This definition clearly fits the intuitions underlying the analysis we proposed for the Dutch abstract object construction.

Slovak is an articleless language, so the nominalized use of the adjective is either bare (27) or accompanied by a demonstrative (14). The predeterminer *všetko* 'all' is attested with bare and demonstrative abstract object constructions (28):

(27)   *Kombináciu*   ***vážneho***   *s*   ***banálnym***   *a*   *často*
      combination   serious   with   banal   and   often
      dokonca   *až*   *s*   *gýčovým*   *uňho*   *mnohí*   *považujú*
      even   even   with   kitch   at.him   many   consider
      za   *zámernú*   *provokáciu.*   [Slovak]
      for   purposeful   provocation
      'Many consider his combination of the serious with the banal and often even with kitch to be a purposeful provocation.'

(28)   *Tereza*   *myslí*   *na*   *otca,*   *ktorému*   *odchodom*
      Teresa   thinks   on   father   who.DAT   departure
      spôsobila   *bolesť,*   *ale*   *aj*   *na*   ***všetko***   ***to***   ***nové***
      caused   pain   but   also   on   all   that   new
      a   ***neznáme***,   *čomu*   *bude*   *musieť*   *odteraz*
      and   unknown   what   will   have-to   from-now-on
      po   *celý*   *život*   *čeliť.*
      for   whole   life   face
      'Teresa is thinking about her father, whom she's hurt by her departure, but also about all the new and unknown that she will have to face her whole life from now on.'

In sum, we find positive evidence in favor of constructions that encode reference to abstract objects via adjectives in English, German, French, Slovak by means of a definite and/or demonstrative article. We also find that the predeterminer equivalent to *all* is attested in all these languages. But this is not enough to determine what structure underlies reference to abstract objects. From Section 3.2, we know that the small clause analysis predicts that we find definites, demonstratives and *all*, but no other determiners and mass quantifiers. For German, Google searches revealed no mass quantifiers, so this language is similar to Dutch. Accordingly, we extend the small clause analysis to German.

Perhaps surprisingly, we find overt mass quantifiers in English that were not possible in Dutch. Glass (2014) provides the example in (29a). Our corpus data in (29b, c) support the productive use of *a little, a bit* and *a lot* in this construction:

(29)   a.   ***A little pretty*** *is just what the doctor ordered*!
      b.   *To me, I think this area has* ***a bit of ugly*** *and a* ***bit of nice*** *to it.*

     c.   ***A little naughty*** *is okay, but a **lot of nice** is better.*

According to Lauwers (2008), mass quantifiers are not allowed in French, but examples are easily found on the internet; examples are also attested in Slovak:

(30)   *Si*   *tout*   *n'est*   *pas*   *beau,*   *il y a*   ***beaucoup***   ***de***   ***beau***.
       if   all   not-is   not   beautiful   there-is   much   of   beautiful
       'Even if everything is not beautiful, there is a lot of beautiful.'   [French]

(31)   *Essayer*   *de*   *remettre*   ***un peu***   ***de***   ***joli***   *dans*   *notre*   *vie*.
       try.INF   to   back-put   a bit   of   pretty   in   our   life
       'Try to put back a little pretty in our life.'

(32)   *V*   *oboch*   *chlapcoch*   *sa*   *mieša*   ***trochu***   ***slovenského***
       in   both   boys   REFL   mix   a-little-of   Slovak
       a   ***trochu***   ***španielskeho***.   *Vraví*   *sa,*   *že*   *'zmiešaniny'*
       and   a-little-of   Spanish   say   REFL   that   mixtures
       sú   *zaujímaví*   *ľudia.*   [Slovak]
       are   interesting   people
       'A little Slovak-ness and a little Spanish-ness is present in both boys. They say that 'mixtures' are interesting people.'

If (30)-(32) are to be analyzed as 'partitive stuff' readings, this provides support against a small clause analysis, and in favor of a nominalization analysis of the abstract object construction in English, French, and Slovak. The syntactic structure of *a little pretty* in (29a) is worked out in Figure 4, and its semantics in (33). As adjectives function both as modifiers (type $\langle\langle e,t\rangle,\langle e,t\rangle\rangle$) and as predicates (type $\langle e,t\rangle$), the type-shift underlying the conversion from the aP in (33b) to the nP in (33c) is quite intuitive.
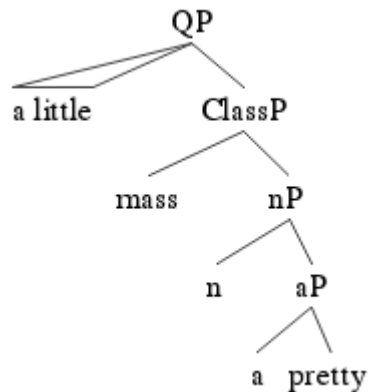
(33) *a little pretty*
    a. [$_{QP}$ *a little* [$_{ClassP}$ mass [$_{nP}$ n [$_{aP}$ a [*pretty*]]]]]
    b. [[$_{aP}$ *pretty*]]: $\lambda P\lambda y[(\mathbf{Pretty}(P))(y)]$
    c. [[$_{nP}$ *pretty*]]: $\lambda x_k[\mathbf{Pretty}(x_k)]$
    d. [[[$_{ClassP}$ mass [$_{nP}$ *pretty*]]]]:
       $\lambda y[\mathbf{R^*}(y, x_k) \wedge \mathbf{Pretty}(x_k)]$
    e. [[[QP *a little* [ClassP *pretty*]]]:
       $\exists y[\mathbf{Pretty^*}(y) \wedge |y| > c_{\text{a-little}}]$

Figure 4: Nominalization analysis (French, English, Slovak)

In words: *a little pretty* denotes a mass realization of the kind 'pretty', the amount of which qualifies as 'a little' in the context ($c_{\text{a-little}}$): 'a bit of pretty stuff'.

French *un peu de joli* (31) and Slovak *trochu slovenského* (32) get the same analysis. We assume that pseudo-partitive *de* is inserted in French *un peu de* NP or *beaucoup de* NP to license genitive case (Doetjes 1997: 218 sqq; Longobardi 2001).

However, this is not necessarily the end of the story. Mass quantifiers like *a lot* and *beaucoup* have nominal uses as bare quantifiers (*Il a beaucoup lu* 'he read a lot'), as discussed by Doetjes (1997), so one might object that mass quantifiers with adjectives do not have the nominalization structure in Figure 4, but rather are to be compared to the pronominal *quelque chose de beau* ('something nice') (see footnote 2). Space limitations do not allow us to exclude this possibility for now; however, we can look for further evidence for or against a small clause vs. nominalization analysis; for this we appeal to modification data.

4.2 Adverbial modification

Adverbial modification is possible in all languages under investigation, cf. English (10b), Dutch (19), German (23a), French (25), and Slovak (35):

(35) **to jediné a podstatne nové,** *čo som*
that unique and substantially new what part
sa dozvedel [Slovak]
REFL found-out
'that unique and substantially new stuff that I learned'

Adverbial modification is expected to be felicitous under nominalization as well as the small clause analysis, so in themselves, these examples do not decide between these two. However, the fact that examples of adverbial modification are widely attested implies that we can take a failure to find similar adjectival modification to be highly suggestive, if not conclusive.

4.3 Adjectival modification

Adjectival modification by regular descriptive adjectives is incompatible with the small clause analysis. We find adjectival modification in the abstract construction to be severely restricted in Dutch (see 19a, b). We find similar restrictions in German. Examples like (36) are attested, but no examples with regular descriptive adjectives were found:

(36) **Das wenige interessante** *in den Zeitungen*
the.N little$_{[+e]adj}$ interesting$_{[+e]}$ in the newspapers
ist mir zu langweilig. [German]
is me.DAT too boring
'The few interesting things in the newspapers bore me.'

The presence of the schwa on both *wenige* and *interessante* indicates adjective inflection. Crucially though, the restricted distribution of adjectival modifiers

mirrors the ban on mass quantifiers, and provides further support for a small clause analysis of the abstract object construction in German.

English, French and Slovak are more liberal. Not surprisingly, they allow adjectives like DP internal *only*, but interestingly, we find descriptive adjectives as well, as illustrated in (37), (38) (from Lauwers 2008), and (39):

(37) a. *Dante is able to realize **the pure good***.
     b. *Your physical appearance doesn't define **the real beautiful** in you.*

(38)   *On   ne   laisse   à   l'exilé   que   **le**   **strict/***
        one   not   leaves   to   the-exiled   that   the   strict$_{Adj}$/
        ***strictement**   **nécessaire**   **à**   **sa**   survie.*   [French]
        strictly$_{adv}$ necessary   to   POSS   survival
        'One leaves to the exiled only the strict/strictly necessary for his survival.'

(39)   ***dobré**   **nové**   je   **zabudnuté**   **staré***   [Slovak]
        good   new   is   forgotten   old
        'the good new means the forgotten old'

We conclude that languages may avail themselves of two structures for reference to abstract objects. One involves nominalization, accompanied by fairly flexible determiner use and rich adjectival modification. Another involves a small clause construction, accompanied by obligatory definite/demonstrative determiner use to achieve closure over an open proposition. The small clause structure imposes severe constraints on adjectival modification for lack of an adjectival projection.

We hypothesize that the route a language takes depends on other features of the grammar, in particular on the productivity of deadjectival nouns and the availability of pronominal structures (*something special*) as grammatical alternatives. However, it goes beyond the scope of this paper to explore these factors; further research will be needed to work out the full picture in this domain. Instead, we close the chapter on reference *via* properties, and move on to reference *to* properties.

5   Reference to properties

Besides reference to humans or abstract objects via properties, McNally & de Swart (2015) distinguish a third reading, which they call the 'relational' reading and which we will call the 'quality' reading here. Reference to properties is not to be mistaken for reference via properties to abstract objects (Section 5.1). As before, we take Dutch data as our starting point in Sections 5.1 and 5.2 before moving on to a cross-linguistic comparison in Section 5.3.

5.1 Reference to properties is not mass-like, no 'sum' interpretation

At first sight, it is difficult to tease apart reference to properties from the reference to abstract objects discussed earlier. Both types of reference resist mass quantifiers (18b and 40), and impose severe constraints on adjectival modifiers: *enige* 'only' in (41) is fine, but not *intense* 'intense' in (42). All kinds of adverbial modifiers (*al te* 'all too' in (43), *intens* 'intens' in (42)) are attested:

(40) ***een beetje rode van de ondergaande zon***
a bit red[+e] of the setting sun
Intended: a bit of red of the setting sun

(41) ***Het enige leuke** aan niet naar school kunnen*
the only_Adj nice[+e] at not to school can
gaan is niet naar school gaan.
go is not to school go
'The only nice thing about not being able to go to school is not going to school.'

(42) *Zonder licht, om **het intens/** *intense **rode***
without light to the intense_adv /intense[+e]adj red[+e]
***van de ondergaande zon** niet te verstoren.*
of the setting sun not to disturb
'Without light, so as not to disturb the intense redness of the sunset.'

(43) ***Het al te zure van citrusvruchten** is in*
the all too sour[+e] of citrus-fruits is in
deze confiture verdwenen.'
this jam disappeared
'The all too sour (aspect) of citrus fruits is lacking in this jam.'

Section 3.2 showed that the abstract object construction involves maximal (sum) mass reference. Reference to properties does not. As a result, the quality reading does not take demonstratives, does not tolerate the predeterminer *al* 'all' (44), and is not compatible with adjectival *veel/weinig* ('much/little') (45):

(44) *Het/ *al het/ *dit **vreemde** van de situatie vind*
the/ *all the *this strange[+e] of the situation find
ik dat politieke partijen het maar laten gebeuren.
I that political parties it just let happen
'The/ *this/ *all the strange thing about the situation, I find, is that political parties just let it happen.'

(45) *Het weinig/ *weinige **vreemde** van de situatie*
the little[+e] strange[+e] of the situation
'the not very strange aspect of the situation'

Additional evidence for a semantic difference between the quality reading and abstract object reading comes from the absence of a 'part-of' interpretation in (46):

(46) ***Het bittere van het bier*** *is een mooi contrast*
the bitter[+e] of the beer is a nice contrast
*met **het zoete** van de **mout**.*
with the sweet[+e] of the malt
'The bitterness of the beer is a nice contrast with the sweetness of the malt.'

Clearly, there is no sum of bitter things in the beer, but the beer has the property of being bitter. We take the evidence accumulated so far to indicate that there is a third reading of Dutch inflected adjectives, in which *het* A[+e] refers to a property. Section 5.2 reviews McNally & de Swart's (2015) analysis of this reading.

5.2 Syntax-semantics interface of reference to properties

McNally & de Swart 2015 show that for the quality reading to obtain, the PP following the adjective must be overt or easily retrievable in context, unlike what is found with the abstract object construction. Moreover, the choice of preposition is restricted to (mostly) *aan* ('at') and *van* ('of'), again in contrast to the abstract object construction. These observations suggest that the DP embedded in the PP has argument status, while the optional PP present in the abstract object construction functions as an adjunct (recall Figure 3 and the semantics in (22)).
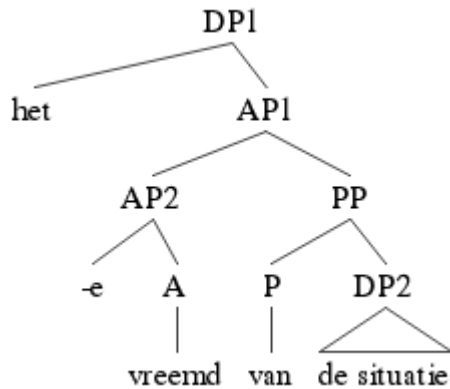
McNally & de Swart (2015) assign the quality reading of Dutch inflected adjectives the structure in Figure 5. Syntactically, the AP is directly embedded under DP. *Het* is the dedicated neuter definite article that appears in this configuration, and no other determiner can embed an AP (or an infinitival VP for that matter; see McNally & de Swart (2015) for discussion).

Figure 5: Reference to properties in Dutch

The details of the syntax-semantics interface of *het vreemde van de situatie* ('the strange[+e] of the situation') are spelled out in (47). In general, *het* A[+e] *aan/van* DP refers to the A aspect of the object the DP denotes.

(47) *het vreemde van de situatie*
the strange[+e] of the situation
[DP *het* [[AP *-e* [A *vreemd*]] [PP *van de situatie*]]]

a. [[*vreemd*]]: $\lambda z \lambda s.\textbf{Strange}(z)(s)$
b. [[*-e*]]: $\lambda P_{<s,<e,t>>}\lambda y \lambda x \lambda s.P_{\text{asp}}(y)(x)(s)$
c. [[*vreemd*$_{+e}$]]: $\lambda y \lambda x \lambda s.\textbf{Strange}_{\text{asp}}(y)(x)(s)$
d. [[[$_{AP}$ *vreemde*$_{+e}$ *van de situatie*]]]^g:
   $\lambda x \lambda s.\textbf{Strange}_{\text{asp}}(\iota y[\textbf{Situation}(y)])(x)(s)$
e. [[[$_{DP}$[$_D$ *het s$_1$* [$_{AP}$ *vreemde*$_{+e}$ *van de situatie*]]]]^g:
   $\lambda P_{<e,<s,t>>}\iota x[P(x)(g(s_1))](\lambda x \lambda s.\textbf{Strange}_{\text{asp}}(\iota y[\textbf{Situation}(y)])(x)(s)) =$
   $\iota x[\textbf{Strange}_{\text{asp}}(\iota y[\textbf{Situation}(y)])(x)(g(s_1))]$

At this point, the question arises whether reference to properties is a special feature of Dutch inflected adjectives, or whether we find the quality reading in other languages as well. As the translations given so far indicate, English does not use adjectives without a nominal core to convey the quality reading. As a result, the meaning of the Dutch examples may be hard to grasp for English readers. The closest relatives of the quality reading in English are derived nouns (cf. the translation in 46), or the paraphrase 'the Adj thing/part about' (48):

(48)   So, the only bad part/thing of not taking the test is that she may not be able to apply for some college scholarships.

In McNally & de Swart (2015), we observe that Dutch tends to assign a degree interpretation to derived nouns with the suffix *-heid* (comparable to English *-ness*), so we do not find deadjectival nouns that refer to properties in this language. A Google search (carried out on 7/4/2016) yields 237 results for Dutch *het enige leuke aan* ('the only nice$_{[+e]}$ of'), but only 6 results for *het enige leuke ding aan* ('the only nice thing about'), and they are all rejected by native speakers. This suggests that Dutch and English use different grammatical strategies to convey reference to properties. Section 5.3 casts the cross-linguistic net a bit wider, and delves deeper into reference to properties in German, French and Slovak.

5.3 The quality reading across languages

Lauwers (2008) points to the productive use in French of *le* A *de* DP to describe 'the A aspect of DP'. He argues that (49a) describes what is vulgar in the story, while (49b), in his terms, refers to a specific instance of vulgarity as it is instantiated in the story (and perhaps different from other instances of vulgarity):

(49) a. *le*   *vulgaire*   *de* *l'histoire*
          the.M   vulgar   of   the-story   [French]
      b. *la*   *vulgarité*   *de* *l'histoire*
          the.F   vulgarity   of   the-story

Evidence supporting the claim that examples like (49a) involve reference to properties and not the abstract object reading comes from the unacceptability of demonstratives in (50) (in contrast to (13)):

(50) *Car c'est là* **le/ *ce** *beau de la*
for it-is there the DEM beautiful of the
chose, on dort. [French]
thing one sleeps

Similarly, we find that the adjective describes an aspect of the object that the DP in the complement of the PP refers to, rather than a part of it, that is, *l'amer* ('the bitter') describes a property of the beer, not a part of it in (51):

(51) *Pour accompagner ce plat riche en saveurs et*
to go-with this dish rich in flavours and
sucré, mais surtout où **l'amer**~Adj~ *de la bière*
sweet but especially where the bitter of the beer
et la puissance du fromage imposent des
and the power of_the cheese impose INDEF-PL
arômes pleins, j'ai choisi un …
aromas full I_have chosen a..
'To go with this dish rich in flavor and sugar, but especially where the bitterness of the beer and the power of the cheese impose full flavors, I chose a…'

So far, we took the fact that the PP complement is obligatory with the quality reading, but optional with the abstract object construction as evidence for the difference between arguments and adjuncts. However, both arguments and adjuncts are realized by means of PPs in Dutch and French, which makes the difference less than transparent. This is where the extension to German and Slovak pays off.

Alexiadou & Iordăchioaia (2013) show that German assigns genitive case to the object of a color noun or a deadjectival noun, while PP complements are not allowed (52a, 53a). Inflected adjectives display the inverse pattern (52b, 53b):

(52) a. ***das Rot*** *des Apfels/ *an dem Apfel*
the.N red the.GEN.N/ apple.GEN at the.DAT.N apple
'the red of the flower (color)'
b. ***das Rote*** **des Apfels/ an dem Apfel*
the.N red~[+e]~ the.GEN.N apple.GEN at the.DAT.N apple
'the red (aspect of) the apple'

(53) a. ***die Schönheit*** (*von*) *der Frau/ *an der Frau*
the.F beauty (of) the.GEN.F woman at the.DAT.F woman
'the beauty of the woman'
b. ***das Schöne*** **der Frau/ an der Frau*
the.N beautiful~[+e]~ the.GEN.F woman at the.DAT.F woman
'the beautiful (aspect) of the woman'

What Alexiadou & Iordăchioaia (2013) do not fully explain is why examples of reference to abstract objects via inflected adjectives regularly turn up in Google searches with DPs marked with genitive case (54):

(54)   a.   *Denn   nun   suchen   wir   nicht,   was   das   Gute*
           for   now   seek   we   not   what   the.N   good[+e]
           *ist,   sondern   was   **das   Gute   des   Menschen**   ist.*
           is   but   what   the.N   good[+e]   the.GEN.M   man   is
           'For now we are not looking for what the good is, but what is the good of mankind.'
       b.   *Sie   liebt   **das   Schöne   der   Welt**.*
           she   loves   the.N   beautiful[+e]   the.GEN.F   world
           'She loves the beauty/everything beautiful of the world.'

We take the contrast between (52b, 53b) and (54a, b) to reside in the difference between the abstract object construction and reference to properties. We posit that the genitive phrases in (54) have adjunct status, whereas the examples with the PP involve complements, in line with what would be expected based on our analysis of Dutch. Genitive case vs. a PP thus seems to be a reliable morpho-syntactic diagnostic for distinguishing the abstract object and quality readings in German.

The case marking system of Slovak works slightly differently, but essentially the same contrasts are reproduced here: no PPs are involved, but we find genitive case with deadjectival nouns (55a) and reference to abstract objects with adjectives (55b) (note the preposition *z* 'of'), while locative case brings out reference to properties (55c):

(55)   a.   *ocenit'*   **dôležit-ost'**   *tejto   práce*   [Slovak]
           appreciate   important.ness   this   work.GEN
           'appreciate the importance of this work'
       b.   *oddeliť*   **to**   **dôležit-é**   *a*   *to*   **nedôležit-é**
           separate   DEM   important   and   DEM   unimportant
           z   tejto   práce
           of   this   work.GEN
           'separate the important and unimportant (parts) of this work' (e.g. one pile of important pages, one pile of unimportant pages)
       c.   *ocenit'*   **to**   **dôležit-é**   *a*   **to**   **nedôležit-é**
           appreciate   DEM   important   and   DEM   unimportant
           na   tejto   práci
           on   this   work.LOC
           'appreciate the important and unimportant (aspects) of this work' (e.g. contributions, implications and other characteristics)

The parenthetical comments in clarify the meaning differences between the abstract object construction in (55b) and the quality reading in (55c).

In sum, what started out as a special feature of Dutch inflected adjectives and which did not have a counterpart in English proves to be a cross-linguistically replicable distinction. The semantic differences between the abstract object and quality constructions are mirrored in different determiner distributions and the contrast between optional and obligatory PP complements in Dutch and French. German and Slovak reflect the difference between the two constructions in the morpho-syntax: in both languages, the possession relation is marked by genitive case, which, unsurprisingly, shows up in the abstract object construction. The argument status of the complement of the relational adjective requires embedding of the DP in a PP in German, and locative case marking on Slovak DPs.

6 Conclusion

In this brief cross-linguistic survey of the ways in which adjectives can be used for reference to and via properties, we have identified the following commonalities and points of variation. First, human reference involves count morphology in all the cases we have observed. Empirical differences are difficult to identify between the null noun analysis (Kester 1996; McNally & de Swart 2015) and the deadjectival nominalization analysis (Giannakidou & Stavrou 1999; Borer & Roy 2010; Alexiadou 2016), so the choice between the two analyses remains open.

Second, we have argued that (mass) reference to abstract objects via properties involves a small clause structure in Dutch (McNally & de Swart 2015) and German, while a nominalization analysis seems supported in French, English, and Slovak. Further research will have to clarify whether the two strategies can co-exist in one language (as Lauwers (2008) seems to suggest).

Third, the cases we have seen of adjectives used for reference to properties are morphologically neither count nor mass-like and thus support neither a nominalization nor a small clause analysis. We suggest that the direct embedding of an AP with relational semantics under DP that we proposed for Dutch in McNally & de Swart (2015) can extend to German, French, and Slovak, though we see no evidence for it in English. The distinct nature of this reading correlates with restrictions on preposition choice in Dutch and the selection of a PP complement in German and locative case in Slovak. English resorts to derived nouns or a nominal paraphrase with *thing* or *aspect* to convey reference to properties. Further research is needed to explain this variation, but an obvious hypothesis is that the distribution of labor between form and meaning is a function of the availability and productivity of different lexical and grammatical resources in each language.

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