# Abstract Meaning Representation of Constructions: The More We Include, the Better the Representation

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**Abstract**

We describe the expansion of the Abstract Meaning Representation (AMR) project to provide coverage for the annotation of certain types of constructions. Past AMR annotations generally followed a practice of assigning the semantic roles associated with an individual lexical item, as opposed to a flexible pattern or template of multiple lexical items, which characterizes constructions such as 'The X-er, The Y-er' (exemplified in the title). Furthermore, a goal of AMR is to provide consistent semantic representation despite language-specific syntactic idiosyncracies. Thus, representing the meanings associated with fully syntactic patterns required a novel annotation approach. As one strategy in our approach, we expanded the AMR lexicon of predicate senses, or semantic 'rolesets,' to include entries for a growing set of constructions. Despite the challenging practical and theoretical questions encountered, the additions and updates to AMR annotation described here ensure more comprehensive semantic representations capturing both lexical and constructional meaning.

**Keywords:** Semantics, Constructions, Meaning Representation

## 1. Introduction

The Abstract Meaning Representation (AMR) project (Banarescu et al., 2013) has created a manually annotated "semantics bank" of text. A goal of AMR is to capture core facets of meaning while abstracting away from idiosyncratic syntactic facts; thus, for example, *She adjusted the machine* and *She made an adjustment to the machine* share the same AMR. The purpose of these annotations is to support natural language processing (NLP) applications such as natural language understanding, generation, and summarization (Liu et al., 2015; Pourdamghani et al., 2016), machine translation, question answering (Mitra and Baral, 2016), information extraction (Pan et al., 2015), and biomedical text mining (Garg et al., 2016; Rao et al., 2017; Wang et al., 2017). With a growing body of over 70 research papers using AMR,[1] the corpus is becoming a benchmark dataset.

As a practical NLP resource, AMR annotation has focused on providing coverage for the more frequent and predictably patterned linguistic phenomena, and therefore has not necessarily provided adequate representations for some of the rarer structures found in the long tail of language (Zipf, 1949). However, as the project matures, we are aiming to expand the representation to go beyond capturing the semantics of purely compositional language to better capture the semantics of constructions in which the meaning is more than the sum of its parts (lexical meanings). From its inception, in 'abstracting away' from language-specific syntactic facts to represent core meaning elements, AMR has annotated a variety of semi- and non-compositional phrases according to a more general lexicon entry capturing the meaning, independent of any particular syntactic derivation. For example, certain realizations of *but, while, whereas, however* and *on the other hand* are represented using a single lexicon entry, contrast-01. Nonetheless, there were gaps and inconsistencies in the treatment of various constructions, including those with the common feature of expressing degrees and quantities of properties and things. There are 8,117 instances of the AMR Degree modifier and 11,785 instances of the Quantity modifier in the last AMR release corpus of 39,260 sentences (Knight et al., 2017). Of course, many of these are not instances of the constructions of focus in this paper; nonetheless, this work provides a deeper and more consistent representation of the semantics of these relatively prevalent phenomena across both compositional and constructional usages. In order to capture the meaning of degree/quantity constructions, we expanded the AMR lexicon of predicate senses, or semantic 'rolesets,' to include entries for a growing set of constructions. Here, we describe the theoretical challenges involved in developing the rolesets and implementing clear guidelines, provide details on the novel rolesets and examples, as well as evaluation in piloting.

## 2. Background & Related Work

### 2.1. Constructions

Everyday language is built up of prefabricated parts and templates that form a speaker's individual discourse experience (Hopper, 1998; MacWhinney, 2001; Bybee and McClelland, 2005). These templates can be thought of as 'constructions,' which are generally defined as any pairing of form and meaning, including both lexical items and phrases (Fillmore et al., 1988; Kay and Fillmore, 1999; Michaelis and Lambrecht, 1996). Fully syntactic patterns arguably have associated meanings: e.g., 'argument structure constructions' are thought to license a verb and its arguments within a clause (Goldberg, 1995). For example, the verb *blink*, for which we might typically expect the mention of a *blinker* and perhaps *eyes*, can be found with roles typical of a caused

[1]Bibliographies: `https://amr.isi.edu/research.html`, `http://people.cs.georgetown.edu/nschneid/cosc672/s17/amr-papers.html`

motion verb: *Jerry blinked the snow off of his eyelashes*. In the case of adjectival predicates, typically one-place predicates (i.e., licensing only one argument), such as *tall*, can be found in contexts with comparisons, superlatives, and even result or consequence clauses: *The boy was not tall enough to ride the rollercoaster.*[2] Whereas lexicosemantic approaches (Frege, 1879; Chomsky, 1981; Pinker, 1989) may take these structures as evidence of a distinct sense of *blink* or *tall* licensing additional arguments, in a construction grammar approach, the construction itself can license the arguments. This distinction also affects what is thought to be stored in the lexicon and, perhaps most relevant to AMR, what would need to be represented in a computational lexicon: additional senses tied to a lexical predicate, or constructional entries.

## 2.2. Abstract Meaning Representation Annotation

The AMR project annotations are completed on a sentence-by-sentence basis, where each sentence is represented by a rooted directed acyclic graph (DAG). See Figure 1.

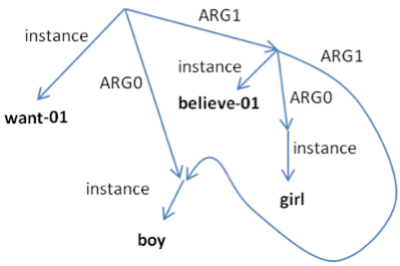


Figure 1: AMR graph for *The boy wants the girl to believe him.*

For ease of creation and manipulation, annotators work with the PENMAN representation of the same information (Penman Natural Language Group, 1989). For example, the following AMR can be glossed as:

1. The boy wants the girl to believe him.

```
(w / want-01
   :ARG0 (b / boy)
   :ARG1 (b2 / believe-01
             :ARG0 (g / girl)
             :ARG1 b))
```

In neo-Davidsonian fashion (Davidson, 1969; Parsons, 1990), we introduce variables (or graph nodes) for entities, events, properties, and states. Leaves are labeled with concepts, so that `(b / boy)` refers to an instance (`b`) of the concept *boy*. Relations link entities, so that `(w / walk-01 :location (p/ park))` means the walking (`w`) was in the park (`p`). When an entity plays multiple roles in a sentence (e.g., `(b / boy)` above), we employ re-entrancy in graph notation (nodes with multiple parents) or variable re-use in PENMAN notation.

AMR concepts are either English words (`boy`), PropBank (Palmer et al., 2005) rolesets (`want-01`), or special keywords indicating generic entity types: `date-entity`, `world-region`, `distance-quantity`, etc. In addition to the PropBank lexicon of rolesets, which associate argument numbers (ARG 0–6) with predicate-specific[3] semantic roles (e.g., ARG0=*wanter* in ex. 1), AMR uses approximately 100 relations of its own (e.g., `:time`, `:age`, `:quantity`, `:destination`, etc.). These AMR-specific relations can be thought of as a fine-grained inventory of modifier role labels.

AMR abstracts away from language-specific, idiosyncratic facts, such that distinct syntactic realizations of the same basic meaning are represented with the same AMR. This includes representing related parts of speech in the same way (e.g., *describe* and *description* are both represented as `describe-01`), as well as representing light verb constructions and related lexical verb counterparts in the same way (e.g., *She made an adjustment to the machine* and *She adjusted the machine* are both represented with `adjust-01`). Because AMR annotators directly build a representation of the meaning of an utterance, they are not limited to meanings which are introduced by lexical items in the sentence, but may introduce meanings which are derived solely through the constructional semantics; for example, `cause-01` and `move-01` can be introduced in a representation for a caused motion construction (e.g., *She talked me into a corner*).

## 2.3. Constructions in Semantic Resources

Other semantic role labeling resources have taken on the challenge of annotating semantic roles assigned by individual predicates and constructions. Although FrameNet (Fillmore et al., 2003) has long included entries for certain light verb constructions and multi-word expressions, the more recent FrameNet Constructicon (Fillmore et al., 2012) represents an effort to extend FrameNet to capture the semantics and roles of the construction itself (i.e. the template of fixed/flexible syntactic slots). The Constructicon lists constructions, such as the Way_manner construction (e.g., *She whistled her way down the lane*), and lists the roles associated with the construction and the Construction Evoking Element (CEE) (e.g., *one's way* in this context). The roles can be thought of as the flexible slots for the construction, while the CEE is the more fixed element.

Of particular relevance to this research, the Constructicon lists a Comparison parent frame (Hasegawa et al., 2010), but indicates that the construction is always instantiated in daughter constructions, including Comparison_equality and Comparison_inequality frames. The Superlative is treated as a separate entry, but notably the roles are similar to those of Comparison, except that what is termed the Standard (the compared-to entity) in the Comparison frame is replaced by a Comparison Set. Our treatment generalizes somewhat over the FrameNet treatment by exploiting a single roleset for all

[2] Note that these degree-related contexts can be compatible with both gradable adjectives and what are typically thought of as ungradable adjectives, as in the humorous *He's too American to vote.*

[3] For ARG0 and ARG1 only, an effort is made to map to Dowty's prototypical agent and patient (Dowty, 1991), respectively.

of these constructions (see Section 5.1). Our general roleset is very similar (in definition, albeit distinct in labeling) to that of Bakhshandeh and Allen (2015), who aim to predict the predicate-argument structure of comparison sentences to support semantic parsing (Bakhshandeh et al., 2016). Also related is the constructional annotation scheme of Dunietz et al. (2017), which targets *causal* language: in its current form their scheme includes the Degree-Consequence and The X-er, The Y-er constructions but excludes argument structure constructions like Caused Motion.

PropBank has always included multi-word verbal predicates (e.g., *eat up*), and has recently been expanding its lexicon of rolesets and annotations to include light verb constructions and the degree and quantity-related constructions that will be discussed here (Hwang et al., 2010; Bonial et al., 2014; Bonial and Palmer, 2016). The expansion of the roleset lexicon was necessary not only for PropBank to provide construction-based annotations, but also because PropBank and AMR maintain a shared lexicon of rolesets that ensures symmetry between the two projects.

## 3. AMR Approach to Constructions

In building the AMR corpus, we have run across a variety of cases where a predicate appeared to be in an atypical context: none of the senses listed in the lexicon of rolesets provided the appropriate role label choices for novel arguments encountered. For example, none of the PropBank rolesets for *blink* list appropriate semantic roles for the thing-moved and path arguments in *Jerry blinked the snow off of his eyelashes*. This left us with a choice of how to deal with such cases, and the options, to some extent, align either with a lexicosemantic approach or a constructional approach: either add a variety of individual rolesets to the lexicon reflecting, for example, a caused-motion sense of *blink*, or add rolesets to the lexicon for particular constructions, such as the caused motion construction.

Some of the practical ramifications of this choice had previously been researched to allow for semantic role labeling annotations of constructions in the PropBank corpus (Bonial et al., 2014). It was found that one must either add many individual rolesets for every predicate compatible with a particular construction or add a single roleset for the construction, to be used freely with all predicates (including previously unseen predicates) occurring in this context.[4] Putting theoretical arguments aside, the latter option clearly had a practical advantage of requiring far less time-consuming manual expansion of the lexicon.

AMR opted to balance both the lexicosemantic and constructional approach by employing two distinct strategies: 1) making use of existing lexical rolesets and AMR's extensive inventory of modifier roles (e.g., Source, Destination) to the greatest extent possible, while 2) adding constructional rolesets only where this alternative allows us to avoid creating numerous rolesets for all predicates compatible with a construction—thereby avoiding, for example, new entries for all gradable adjectives compatible with the comparative construction. The cases in which each strategy was employed are discussed in turn in the sections to follow.

[4]This is not to say that which predicates occur within a particular constructional context is unimportant. On the contrary, generalizing and explicitly marking the construction pattern allows for further research into which predicates (and potentially which semantic features of those predicates) can combine felicitously with the constructional semantics.

## 4. Exploiting Lexical Rolesets and Modifier Roles

Previously unseen usages of verbs in the ditransitive (e.g., *The same friend Facebooked me the invite*), resultative (e.g., *Sandra kissed him unconscious*), caused motion (e.g., *The crowd booed him off the stage*), and intransitive motion constructions (e.g., *The fly buzzed into the room*), are handled with the first strategy. Namely, these constructions are annotated using an existing roleset reflecting a canonical, or relatively frequent and commonly recognized, sense of the lexical predicate. Roles and semantics arguably invoked by the construction (and therefore not expected or covered in the existing lexical predicate's roleset) are then represented with existing AMR modifier roles/relations, such as Source, Destination, and Domain (expressing statehood), as well as the introduction of implicit predicates, such as Cause-01 and Move-01. For example, the sound emission sense rumble-01 provides coverage for the Arg0 "rumbler" role while AMR's Path modifier relation provides coverage for the path argument licensed by the intransitive motion construction:

**Rumble-01**
Arg0: entity rumbling
Arg1: sound/utterance
Arg2: hearer

2. The troops rumbled along the main road.

```
(r / rumble-01
      :ARG0 (t / troop)
      :path (a / along
            :op1 (r2 / road
                  :mod (m / main))))
```

Similarly, note the use of blink-01, meaning "close eyes for a second," in combination with implicit predicates cause-01 and move-01 in the AMR for the following caused motion construction:

**Blink-01**
Arg0: blinker
Arg1: eyes (usually unstated)

3. He blinked the snow off his eyelashes.

```
(b / blink-01
      :ARG0 (h/ he))
      :ARG0-of (c5 / cause-01
            :ARG1 (m2 / move-01
                  :ARG1 (s / snow)
                  :source (e / eyelash
                        :part-of h))))
```

i.e. *He blinked, the blinking caused the snow to move from his eyelashes.*

## 5. Expanding the Lexicon with Constructions

We chose to add constructional rolesets for a family of constructions involving degrees and quantities. This choice was motivated in part by the frequency and productivity of these constructions and by their fairly nuanced semantics, which could not adequately be captured with existing rolesets or modifier roles.

### 5.1. Comparative, Superlative, & Degree-Consequence Constructions

Comparative, superlative, and what we term the 'Degree-Consequence' construction are all handled with a single roleset, Have-Degree-91,[5] which is a semantically finer-grained replacement for many cases of the existing AMR modifier role, Degree. Degree will continue to be used in cases of intensifiers or downtoners (e.g., *She was a **little bit** nervous*; *Carthage was **utterly** destroyed*).

**Have-Degree-91**
Arg1: domain, entity characterized by attribute
Arg2: attribute (e.g. tall)
Arg3: degree itself (e.g. more/most, less/least, equal)
Arg4: compared-to
Arg5: superlative: reference to superset
Arg6: consequence, result of degree

The comparative construction licenses an additional argument of the entity that another entity is being compared to, with respect to a particular attribute. This is captured by Arg4 in the roleset, for example:

4. The girl is taller than the boy.
```
(h / have-degree-91
      :ARG1 (g / girl)
      :ARG2 (t / tall)
      :ARG3 (m / more)
      :ARG4 (b / boy))
```
i.e. *The girl is more tall compared to the boy.*

Note that the Arg3 'degree itself' may not appear explicitly in the sentence and may instead be realized by a comparative form of the adjective. Annotators are instructed to use the base form of adjectives in all cases, and introduce into the Arg3 slot *more* (as seen above), *less* (for cases such as *This book is less expensive*, or *equal* (for cases like *The girl is as tall as the boy*).

Previously, the compared-to entity (Arg4) was represented by a modifier role, Compared-to, in AMR; this role is superseded by Have-Degree-91.[6] The previous role was found to be somewhat unintuitive to annotators in its attachment position, and, in the absence of a full roleset, it failed to convey that two things were being compared with respect to a particular attribute. This led to some confusion and inconsistencies in annotation.

Although very similar to the comparative, the superlative invokes a subset/superset relation—an entity or subset of entities is compared to a superset of relevant entities with respect to some property. The reference to this superset is captured with Arg5, for example:

5. She is the tallest girl on the team.
```
(h / have-degree-91
      :ARG1 (s / she)
      :ARG2 (t / tall)
      :ARG3 (m / most)
      :ARG5 (g / girl
            :ARG0-of (h2 / have-org-role-91
                  :ARG1 (t2 / team))))
```
i.e. *She is the most tall of the girls on the team.*

Previously, superlatives were treated identically to comparatives, using the Compared-to role. This was a more superficial representation, where the Compared-to for the above example would be *team* alone, as opposed to the more precise representation wherein the tallness of one girl is being compared to the tallness of the set of girls on the team.

One of the rarer, but also more problematic, constructions involving Degree that we encountered were cases of the 'Degree-Consequence' construction. This construction licenses an argument representing the result or consequence of the degree to which a state holds. This construction was particularly problematic because annotators lacked any good way of representing the consequence argument or connecting it to the degree information, thereby leading to inconsistent and superficial treatments. The FrameNet Constructicon provides coverage for one species of this construction, which it calls the 'Degree-so' construction. While this is limited to constructions involving the word *so* (e.g., *The smell is so terrible, you want to throw up*), our definition of this construction is broader, allowing for a greater variety of degree words in this slot. The result or consequence argument is captured by Arg6:

6. The watch is too wide for my wrist.
```
(h / have-degree-91
      :ARG1 (w / watch)
      :ARG2 (w2 / wide-02
            :ARG1 w)
      :ARG3 (t / too)
      :ARG6 (f / fit-06
            :ARG1 w
            :ARG2 (w3 / wrist
                  :part-of (i / i))))
```

Note that the implicit predicate *fit* is introduced, capturing the fact that the watch is too wide[7] with respect to fitting.

[5] AMR uses a numbering convention in which rolesets introduced to the shared PropBank/AMR lexicon for the purposes of enriching AMR specifically are numbered "-91." Other rolesets in the lexicon are numbered starting with 1, increasing sequentially. This convention should not be taken to mean that there are 90 other senses of a particular relation.

[6] Retrofitting efforts for existing data are described in Section 6.

[7] The AMR in ex. 6 repeats the variable `w`, making explicit that the watch is the wide entity as well as the first item in the comparison. We only do this when the concept in the Arg2 slot (corresponding to the adjective) is itself a predicate with a roleset in the lexicon. This is not the case in ex. 5, in which *tall* does

Although we initially piloted a deeper representation that could potentially capture deontic modality, possibility, and polarity (e.g., above, including negative polarity on the fitting event, indicating that the consequence is that the watch does NOT fit), we discovered that the multitude of contexts in which this construction can be used makes adding such information too challenging for consistent annotation.[8] For example, if one says *I was too tired to drive*, context may or may not make clear whether the driving actually took place. Thus, this is one case in which practical considerations of what can be captured consistently outweighed the desire for a deeper representation.

## 5.2. Parallel Quantity Constructions

Paralleling Have-Degree-91 is Have-Quant-91, which is used for comparisons and superlatives relating to quantities of things as opposed to qualities or properties. Have-Quant-91 has existed in AMR in past releases to serve as the reification of the modifier role Quantity. However, the roleset was expanded and refined as we noted the many parallel cases of Degree-based constructions and Quantity-based constructions. Note the similar arguments to Have-Degree-91:

**Have-Quant-91**
ARG1: entity (thing being quantified)
ARG2: quantity (numerical or quantifier: many, much)
ARG3: degree mention (more, less, equal, too)
ARG4: compared-to
ARG5: superlative: reference to superset
ARG6: consequence, result

The roles of this roleset carry largely the same semantics as Have-Degree-91, applied to quantities of things, including the comparative:

7. He sold as many cars as his competitor.

```
(h / have-quant-91
      :ARG1 (c / car
            :ARG1-of (s / sell-01
                  :ARG0 (h2 / he)))
      :ARG3 (e / equal)
      :ARG4 (c3 / car
           :ARG1-of (s2 / sell-01
              :ARG0 (p / person
                    :ARG0-of (c2 / compete-02
                          :ARG1 h2)))))
```

and the 'Quantity-Consequence' construction:

8. I had too many books to carry them all.

```
(h2 / have-quant-91
      :ARG1 (b / book
            :ARG1-of (h / have-03
                  :ARG0 (i / i)))
      :ARG2 (m / many)
      :ARG3 (t / too)
      :ARG6 (c / carry-01
            :ARG0 i
            :ARG1 b))
```

## 5.3. Comparing Resemblance Construction

These constructions generally fit the pattern 'X [verb] more/less like Y than Z' and involve the comparison of two separate resemblances. To our knowledge, this type of construction has not received much attention in linguistic literature. After struggling and failing to find a good fit for Have-Degree-91 with the slightly distinct semantics of this construction and the arguments it licenses, we opted to introduce a new roleset, which showed reasonably high agreement in piloting—Have-Degree-of-Resemblance-91:

**Have-Degree-of-Resemblance-91**
Arg1: thing resembling other things
Arg2: first resemblance under comparison
Arg3: second resemblance under comparison
Arg4: degree word comparing Arg2 to Arg3

For example:

9. They dance more like the natives here than normal people.

```
(h / have-degree-of-resemblance-91
      :ARG1 (d / dance-01
            :ARG0 (t / they))
      :ARG2 (d2 / dance-01
            :ARG0 (n / native
                  :location (h2 / here)))
      :ARG3 (d3 / dance-01
            :ARG0 (p / person
                  :ARG1-of (n2 / normal-02)))
      :ARG4 (m / more))
```

i.e. *Their dancing resembles the dancing of natives here more than it resembles the dancing of normal people.*

Admittedly, this is a somewhat shallow representation of the rich semantics of this construction, which pushes off much of what is needed to interpret the sentence into the semantics of the roleset as opposed to the inventory of relations generalizable across the AMR corpus. Nonetheless, including specific guidelines for such constructions does allow them to be captured consistently, and we leave off a deeper interpretation of "resemblance" to future work.

## 5.4. The X-er, The Y-er Construction

A final construction requiring the introduction of an additional roleset is The X-er, The Y-er construction, otherwise known as the Covariational-Conditional construction (Fillmore et al., 1988; Culicover and Jackendoff, 1999; Goldberg, 2003). To capture the specific type of correlation expressed by this construction, we introduced a new roleset:

not yet have a corresponding roleset in the PropBank lexicon, and hence `s` (the entity that is tall) only occurs once.

[8] Even this relatively superficial representation, allowing for the introduction of implicit fit-06, may lead to disagreements regarding precisely what implicit predicate should be used.

**Correlate-91**
Arg1: X, degree/quant word modifying first item changing in relation to Arg2
Arg2: Y, degree/quant word modifying second item changing in relation to Arg1

A challenge in creating and implementing this roleset was determining what should head the arguments of the construction: the items changing, or the degree mentions? After piloting with an alternative roleset, we decided that the clearest and most precise roleset would focus on the degree words, since these are easily recognizable to annotators, and semantically it is the degree to which something holds that is correlated with another degree. For example:

10. The longer he is around, the more miserable I will be.

```
(c / correlate-91
      :ARG1 (m2 / more
            :ARG3-of (h2 / have-degree-91
                  :ARG1 (b / be-located-at-91
                        :ARG1 (h / he)
                        :ARG2 (a / around))
                  :ARG2 (l2 / long-03
                        :ARG1 b)))
      :ARG2 (m3 / more
            :ARG3-of (h3 / have-degree-91
                  :ARG1 (i / i)
                  :ARG2 (m / miserable))))
```

i.e. *An increase in how long he is around correlates with an increase in how miserable I am.*

## 6. Implementation and Evaluation

After a relatively stable draft of guidelines was decided upon and new rolesets were implemented, these guidelines were given to two annotators at two different sites and we piloted using a 'Challenge Set' of sentences selected from the AMR corpus using keyword searches followed by manual selection in an attempt to represent the variety of degree and quantity-based constructions described thus far, including tricky cases with clear inconsistencies in past annotations. On this set of 50 sentences, annotators achieved an overall agreement rate, calculated as a 'smatch' score (Cai and Knight, 2013), of 88.6%, which is a relatively high agreement rate for AMR. Although we cannot provide agreement rates on these specific instances prior to the piloting of these guidelines (only certain portions of the AMR corpus are double-annotated), we can anecdotally report that our efforts have reduced the inconsistency and superficiality with which annotators were handling cases previously.

The bulk of the disagreements in the challenge set related to what concept served as the root or top node of the AMR annotation, with one annotator rooting the AMR with the Have-Degree-91 roleset, while another would embed this further down into the annotation, heading the AMR instead with, for example, a focal item in a comparison. Additional guidance was given to annotators on this subject in the guidelines: annotators are encouraged to use the constructional roleset as the root concept in cases where the comparison and/or correlation is focal, including cases of the copula (e.g., *She **is** the tallest and the youngest in the class*). Nonetheless, the selection of the appropriate root is necessarily somewhat subjective and remains a source of disagreement throughout other annotations as well.

Given the success in piloting, we have adopted the new guidelines and rolesets in recent annotations, and we have also completed retrofitting of past annotations. Using keyword searches over the annotations and text (e.g., 'Compared-to'), we discovered an initial set of about 4,600 annotations that potentially needed retrofitting for Have-Degree/Quant-91 (the remaining cases were found to be simple usages of degree modifiers, like *very*, which remain unchanged), and about 30 potential Correlate-91 cases. These cases were flagged and, if needed, the annotations were updated by the team at the site where the instance was originally annotated.

## 7. Conclusions & Future Work

The next release of the AMR corpus in early 2018, totaling 59,783 AMRs, includes the revised annotations and additional annotated sentences completed under the new guidelines. The corpus counts of the constructions of focus here are given in Table 1.

| Use Case | Roleset/Relation | Count |
|---|---|---|
| Downtoners, intensifiers | Degree | 4547 |
| Comparison, superlative, degree-consequence | Have-Degree-91 | 4943 |
| Comparison, superlative, quantity-consequence | Have-Quant-91 | 1122 |
| Comparing resemblances | Have-Degree-of-Resemblance-91 | 9 |
| The X-er, The Y-er | Correlate-91 | 38 |

Table 1: Counts of described degree/quantity related constructions in forthcoming AMR release corpus.

Although some of the new representations fall short of what we could ideally capture (for example, the nuances of the consequence argument in Degree/Quantity-Consequence constructions), we are optimistic that these additions will increase the depth and consistency of annotations. In the future, we hope to add some of the more detailed aspectual and modal properties in a second layer of annotation, in a fashion similar to recent explorations of adding Richer Event Description (O'Gorman et al., 2016) annotation on top of AMR.

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