PropBank Guidelines Addendum
LINK-PCR and LINK-SLC annotation

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1 Link SLC

1.1 Relative Clause Annotation (Link SLC)

Relative clauses are clauses that modify a N or a NP as in 'answers that we'd like to have.' Relative clauses also include a trace, which is co-indexed with the relative pronoun in TreeBank (e.g. 'that'/'which'/'who'). Alternatively, the relative pronoun can be omitted in English: 'answers we'd like to have.' In these cases the TreeBank will still include a placeholder for the relative pronoun, but a '0' will appear where the explicit relative pronoun normally appears.

For example, in the following TreeBank annotation, the object position of the verb has a trace (NP *T*-6), which is being co-indexed with the relative pronoun (WHNP-6 that/which/0).

TreeBank annotation:

```
(NP (NP answers)
     (SBAR (WHNP-6 that/which/0)}
          (S (NP-SBJ-3 we)
             (VP 'd
                 (VP like
                     (S (NP-SBJ *-3)
                        (VP to
                            (VP have
                                (NP *T*-6)))))))))
```

Whereas, syntactically, the trace is being co-indexed with the relative pronoun, semantically, there is a relationship between the trace and the NP answers which is not being represented in TreeBank. To capture this relationship, which is useful for many applications, PropBank annotators should add a link from the relative pronoun to the NP it is associated with. Firstly, the relative pronoun should be annotated as LINK-SLC (selectional constraint link). Secondly, the annotator should select the appropriate NP node and create the link using the '*'. At this point, the linked annotation should appear on the selected NP node.

PropBank annotation:
Arg1: [NP *T*-6]
LINK-SLC: [WHNP-6 that/which/0] * [NP answers]
Rel: have
Arg0: [NP-SBJ *-3]

Similarly, if a relative clause modifies a temporal or a locative, the trace of the temporal or locative is marked as ArgM-TMP or ArgM-LOC, and the appropriate relative pronoun 'when' or 'where' is annotated as ArgM-LINK-SLC and linked to an NP:

*John found the place where-3 his parents had met *T*-3.*
Arg0: his parents
Rel: met
ArgM-LOC: [*T*-3]
LINK-SLC: where * the place

Although they are not true relative clause constructions, infinitival relatives are also treated in the same manner. Note that infinitival relatives will always have a '0' in the position of the relative pronoun:

TreeBank annotation:

```
(NP (NP a movie)
      (SBAR (WHNP-1 0)
            (S (NP-SBJ *)
               (VP to
                   (VP see
                       (NP *T*-1))))))
```

PropBank annotation:
Rel: see
Arg1: [NP *T*-1]
Arg0: [NP-SBJ *]
LINK-SLC: [WHNP-1 0] * [NP a movie]

Relative clauses should be annotated in all cases where a trace that is co-indexed with a relative pronoun (or empty relative pronoun '0') is a numbered or adjunct argument of the relation. This includes the possessive relative pronoun 'whose':

TreeBank annotation:

```
   (NP (NP (NN men)
              (SBAR
                (WHNP-2
                    (WP whose)
                    (NNS noses)
                  (S
                    (NP-SBJ
                      (PRP he)
                    (VP
                      (VBD rubbed)
                      (NP
                        (-NONE- *T*-2)
                      (PP-CLR
                        (IN in)
                        (NP
                          (DT the)
                          (NN ground)))))))))
```

PropBank annotation:
Rel: rubbed

Arg1: [-NONE- *T*-2]
LINK-SLC: [WHNP-2 whose noses] * [NP men]
Arg0: [NP-SBJ he]
Arg2: [PP-CLR in the ground]

However, if the trace NP node is not a sister to the relation, then the relative clause should NOT be annotated. These will be cases, for example, where the trace co-indexed with a relative pronoun is further embedded in a prepositional node, so it is a daughter to the relation rather than a sister:

TreeBank annotation:

```
(NP (NP (NN game shows)
        (SBAR
          (WHPP-1
            (IN of
            (WHNP
              (WDT which)
          (S
            (NP-SBJ
              (PRP It)
            (ADVP-TMP
              (RB recently)
            (VP
              (VBD bought)
              (NP (NP 49\%
                      (PP -NONE- *T*-1)))))))
```

PropBank annotation:
Arg0: [NP-SBJ It]
ArgM-TMP: [ADVP-TMP recently]
Rel: bought
Arg1: [NP 49% -NONE- *T*-1]

Additionally, the relative clause should NOT be annotated when the relation is the subordinate verb in an infinitival complement because, in these cases, the relative clause does not syntactically modify the verb of the complement clause:

*The man that-1 *T*-1 wanted *PRO*-1 to leave home.*
Rel: wanted
Arg0: *T*-1
LINK-SLC: that * The man
Arg1: *PRO*-1 to leave home

As opposed to. . .

*The man that-1 *T*-1 wanted *PRO*-1 to leave home.*
Rel: leave
Arg0: *PRO*-1
Arg1: home

Be careful to distinguish the above case from those of coordinated verb constructions, in which the relative clause should be annotated for each relation:

*The antiquities which-1 you have stolen *T*-1 and handed *T*-1 over to the antiquities mafia.*
Rel: stolen
Arg0: you
Arg1: *T*-1
LINK-SLC: which-1 * The antiquities

And, similarly. . .

*The antiquities which-1 you have stolen *T*-1 and handed *T*-1 over to the antiquities mafia.*
Rel: [handed][over]
Arg0: you
Arg1: *T*-1
LINK-SLC: which-1 * The antiquities
Arg2: to the antiquities mafia

2 Annotation of Null Elements, linking

2.1 Reduced Relative Annotation

A relative clause may be reduced when passive, resulting in the unique syntax of a reduced relative clause. For example, a passive relative clause construction such as '**The woman that was dressed in blue** walked past the house' can be reduced to '**The woman dressed in blue** walked past the house.' Because the verb in these cases is always passive, the TreeBank annotation of reduced relatives will include an object trace after the verb. However, unlike normal passive constructions, this trace will never be co-indexed with the subject. Thus, when annotating the verb in a reduced relative construction, the annotator must firstly tag the trace as Arg 1 (just as one would do with a normal passive construction). Secondly, the annotator must select the appropriate subject NP node that the trace is associated with, and create the link between the object trace and the subject using the '&' link.

TreeBank Annotation:

```
(S
  (NP-SBJ-1
    (DT This)
  (VP
    (VBZ is)
    (VP
      (VBN considered)
      (S
        (NP-SBJ
          (-NONE- *-1)
        (NP-PRD
          (NP
            (CD one)
          (PP
            (IN of)
            (NP
              (NP
                (DT the)
                (JJS biggest)
```

```
      (NNS caches)
    (VP
      (VBN seized)
      (NP
        (-NONE- *)
      (PP-LOC
        (IN in)
        (NP
          (DT the)
          (NN district)
```

PropBank Annotation:
Rel: seized
Arg1: [NP -NONE- *] & [NP the biggest caches]
ArgM-LOC: [PP-LOC in the district]

2.2 Annotation of *PRO* (Link PCR)

Many traces found in the TreeBank arise as a result of the movement of a constituent from its canonical position. Movement leaves a trace, represented by a * in the TreeBank. *PRO*, on the other hand, does not arise as a result of movement. Rather, *PRO* arises where there is an underspecified, or unrealized subject of a verb. For example, the subject of the verb 'leave' in the phrase 'she tried to leave,' is not realized. However, the TreeBank will represent the unrealized subject of 'leave' with *PRO*:

*She-1 tried *PRO*-1 to leave*
Rel: leave
Arg0: *PRO*-1

In cases like that of the example above, the *PRO* element is co-indexed with the fully realized subject because the *PRO* is positioned in a clause that is governed by the higher clause with the same subject, 'she.' However, there are also cases in which *PRO* arises but it is not governed by a higher clause. In these cases, it is not co-indexed with a fully realized subject. For example:

TreeBank annotation:

```
(NP-SBJ
   (NP
     (PRP it)
   (S
     (-NONE- *EXP*-1)
  (VP
    (VBZ is)
    (ADJP-PRD
      (JJS best)
    (S-1
      (NP-SBJ
        (-NONE- *PRO*)
      (VP
        (RB not)
        (TO to)
        (VP
          (VB use)
```

```
          (NP
            (PRP it)
          (S-CLR
            (NP-SBJ
              (-NONE- *PRO*)
            (VP
              (TO to)
              (VP
                (VB cut)
                (NP
                  (ADJP
                    (RB very)
                    (JJ hot)
                  (NN food)
```

PropBank annotation:
Rel: cut
Arg0: [NP-SBJ -NONE- *PRO*]
Arg1: [NP very hot food]

When annotating *PRO* that is not indexed, if the annotator is certain that the subject is realized elsewhere in the instance, then a link should be created between *PRO* and the explicit reference. First, annotate *PRO* with its appropriate argument, then select the node of the explicit subject mention associated with *PRO* and link the two nodes together using the '*', which is converted to a PCR (pragmatic coreference) link in post-processing.

TreeBank annotation:

```
(NP-SBJ
    (NP
      (NNP China)
      (POS 's)
    (NN income)
    (NNS taxes)
  (VP
    (VBD amounted)
    (PP-CLR
      (TO to)
      (NP
        (QP
          (RB approximately)
          (CD 180)
          (CD billion)
    (, ,)
    (S-ADV
      (NP-SBJ
        (-NONE- *PRO*)
      (VP
        (VBG accounting)
        (PP-CLR
          (IN for)
          (NP
```

```
(NP
  (QP
    (RB about)
    (CD 6)
  (SYM \%)
(PP
  (IN of)
  (NP
    (NP
      (DT the)
      (NN state)
      (POS 's)
    (JJ financial)
    (NNS revenues)
```

PropBank annotation:
Rel: accounting
Arg0: [NP-SBJ -NONE- *PRO*] * [NP China's income taxes]
Arg1: [PP-CLR for about 6% of the state's financial revenues]

The goal of this annotation is to provide additional semantic information about the arguments of the verbs. In some cases, antecedents are not syntactic constituents, or have a different morphological form, as the possessive pronoun below illustrates:

On the issue of abortion , Marshall Coleman wants to take away your right [*] to choose and give it to the politicians.
ARG0: [*PRO*] * [your]
REL: choose

However, note that the null element should be linked to the highest possible node containing its referent without recursively annotating other arguments or the rel itself. If this is not possible, the link should be omitted.