**1. Same/Different meaning judgment task (based on Dapretto & Bookheimer, 1999)**

In this experiment, participants are presented with pairs of sentences and they have to decide whether they mean roughly the same thing.

Here is a description of the materials I have constructed for this task eons ago (in 2007/2008!):

Design: a two-way manipulation (Syntactic vs. Semantic)

We have 80 items:

1-40 use Active/Passive constructions

41-80 use the DO/PP constructions

There are 4 versions of each item: two semantic versions (same and different) and two syntactic versions (same and different)

Here is a sample Active/Passive item:

**Condition: SEM (same)**Anna invited the composer. — Anna invited the songwriter.

**Condition: SEM (diff)**

Anna invited the composer. — Anna invited the translator.

**Condition: SYNT (same)**

Anna invited the composer. — The composer was invited by Anna.

**Condition: SYNT (diff)**

Anna invited the composer. — The composer invited Anna.

So, we have 80 items \* 4 = 320 trials total. These trials are divided across four experimental lists (see LIST NUM column), such that each list contains only one version of an item (following a standard Latin Square design).

There are further various things that are balanced across items (see columns TYPE1, TYPE2, and TYPE3):

**TYPE1:** the construction used in the first sentence

items 1-20 = active

items 21-40 = passive

items 41-60 = DblObj

items 61-80 = PP

**TYPE1\_sameconstr:** whether the same structure is used across the two sentences

The construction is always the same for the ***SEM*** trials (balanced between active and passive for the Active/Passive constructions, and between DblObj and PP for the DO/PP constructions), and it can either be the same or different for the ***SYNT*** trials.

In particular, it is always different for the ***SYNT\_SAME*** trials (because that is how the same meaning is expressed - via two different constructions: e.g., Anna invited the composer — The composer was invited by Anna; again, things are balanced between active and passive for the Active/Passive constructions, and between DblObj and PP for the DO/PP constructions),

and it is either the same or different for the ***SYNT\_DIFF*** trials (balanced, of course!):

e.g.,

Actives/Passives

different: Anna invited the composer — The composer invited Anna

same: Elizabeth disliked the proprietor — Elizabeth was disliked by the proprietor

DO/PP

different: Brenda read the expert a passage — The expert read a passage to Brenda

same: Amanda lent the cook some money — The cook lent Amanda some money

(So, overall, we have 200 trials where the structure is the same across the two sentences, and 120 trials where it is different, so we can also look at syntactic priming.)

**Constructions**

SEM trials

* The construction is always the same
* (balanced between active and passive for the Active/Passive constructions, and between DblObj and PP for the DO/PP constructions)

SYNT trials

* The construction can be same or different
* SYNT\_SAME
  + The construction is always different
* SYNT\_DIFF
  + The construction is either the same or different
  + (balanced)

**TYPE2:**whether in the first sentence in the pair the occupation noun or the name is mentioned first (each sentence contains an occupation noun and a name)

odd-numbered items = name-occ

even-numbered items = occ-name

**TYPE3:**details on how exactly the words in the 2nd sentence differ from the words in the first. Note that this does not apply to the***SYNT\_SAME/DIFF*** trials because in these trials the words are identical between the two sentences and only the word order differs.

For the ***SEM\_DIFF*** trials we have

Actives/Passives

noun\_switch trials: Anna invited the composer — Anna invited the translator

verb\_switch trials: The bystander overheard James — The bystander questioned James

DO/PP

DO\_switch trials: The professor loaned Joshua a dictionary — The professor loaned Joshua a periodical

PP\_switch trials: Amanda lent the cook some money — Amanda lent the carpenter some money

For the ***SEM\_SAME*** trials we have

Actives/Passives

noun\_synon trials: Anna invited the composer — Anna invited the songwriter

verb\_synon trials: The comedian ridiculed John — The comedian mocked John

obj\_synon trials: The mechanic showed Pamela the automobile — The mechanic showed Pamela the car

occup\_synon trials: Amanda lent the cook some money — Amanda lent the chef some money

So, we have 4 experimental lists, each containing 80 trials (40 of each of SEM and SYNT, and 10 of each of ActPas\_SEM\_DIFF, ActPass\_SEM\_SAME, ActPas\_SYNT\_DIFF, ActPass\_SYNT\_SAME, DOPP\_SEM\_DIFF, DOPP SEM\_SAME, DOPP SYNT\_DIFF, and DOPP\_SYNT\_SAME).

Any given participant will (most likely) see 1 list.

Within each list, let’s distribute the 80 trials across 2 runs with 40 trials each (with 5 trials of each of ActPas\_SEM\_DIFF, ActPass\_SEM\_SAME, ActPas\_SYNT\_DIFF, ActPass\_SYNT\_SAME, DOPP\_SEM\_DIFF, DOPP SEM\_SAME, DOPP SYNT\_DIFF, and DOPP\_SYNT\_SAME)

The trial timing will be as follows:

300 ms: trial-initial fixation

2,000 ms: sentence 1 (presented all at once)

200 ms: inter-sentence interval

2,000 ms: sentence 2 (presented all at once)

1,500 ms: “RESPOND”

TOTAL duration: 6 sec

So, the experimental trials within each run will take 40 trials \* 6 sec = 240 sec. We’ll also add 120 sec of fixation, for a total run duration of 360 sec (6 min).

Condition ordering and fixation distribution among the trials will be determined using the optseq algorithm (here, we’ll be using the 8 “subconditions”: ActPas\_SEM\_DIFF, ActPas\_SEM\_SAME, ActPas\_SYNT\_DIFF, ActPas\_SYNT\_SAME, DOPP\_SEM\_DIFF, DOPP SEM\_SAME, DOPP SYNT\_DIFF, and DOPP\_SYNT\_SAME) - let’s create, say, 8 sequences to use.

The arguments that the script should take are therefore:

\* subject ID

\* list (1, 2, 3 or 4)

\* run (1 or 2)

\* counterbalancing order (1-8)

The data file should save the following info:

column

1 subjectID

2 list

3 run

4 counterbalancing order

5 trial num within a run (1 through 80; NA for fix trials if those are included in the output file)

6 item num (see ItemNum(1-80) column in the materials file)

7 condition (ActPas\_SEM\_DIFF, ActPas\_SEM\_SAME, ActPas\_SYNT\_DIFF, ActPas\_SYNT\_SAME, DOPP\_SEM\_DIFF, DOPP SEM\_SAME, DOPP SYNT\_DIFF, and DOPP\_SYNT\_SAME; or “fix” if those are included)

8 Type1

9 Type1\_sameconstr

10 Type2

11 Type3

12 onset from the beginning of the run (from the trigger)

13 response (1 or 2)

14  RT

15 correctness (1 or 0)