Mixed Design: A Study of Language Processing

We will study how long it takes for subjects to verify sentences of the following form.

   The star is beside the heart.

   The star is above the heart.

   The star is below the heart.

Sentences will be of six types according to the following design:

		Sentence	
		True	False
	Beside		
Preposition	Above		
	Below		x

For example, a subject might be shown ♥★ plus the sentence, "The star is below the heart." This sentence comes from the cell marked "X" because it is <u>false</u> and uses the preposition <u>below</u>. In the task, the subject is shown the figure for 500 ms before the sentence is presented. Then the subject presses either the "true" response key or the "false" response key as quickly as possible.

Each subject gets each of the six types of sentence 15 times (replications). (A separate random order is chosen for each subject.) The data for each subject are the <u>means</u> of the 15 replications for each sentence type (i.e., six means per subject).

There are two subject variables of interest: laterality (left-handers may process language differently from right-handers) and native vs. non-native speakers (there may be a recoding step for non-natives). Therefore, subjects will be selected according to the following design:

	Native Speakers	Non-Native Speakers
Right-handed	10 Ss	10 Ss
Left-handed	10 Ss	10 Ss

Source Table

<u>Between</u>

Mean	1	total Obs $= 3 \times 2 \times 10 \times 2 \times 2$
Laterality	1	$= 240$
Nativeness	1	All Systematic cells $= 24$
L x N	1	Between cells $= 2 \times 2 = 4$
S/LN	<u>36</u>	Within cells $= 24 - 4 = 20$
	40	df between $= $ # of Ss

<u>Within</u>

Preposition	2
P x L	2
P x N	2
P x L x N	2
PxS/LN	72
Truth	1
T x L	1
T x N	1
T x L x N	1
TxS/LN	36
P x T	2
P x T x L	2
P x T x N	2
P x T x L x N	2
PxTxS/LN	<u>72</u>

Total df $=$ 240