

## Homework – main effects vs. interactions

For each of the following:

1. Say what each main effect and interaction effect would answer or test for
2. Which is/are the critical comparisons for addressing the question. Or can the question even be addressed? (*NOTE: In studies that have multiple variables, often there are some analyses that are basically uninteresting, but “come for free” with what you actually care about – so what I’m asking here is for you to identify which analyses you would really care about....*)

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1. A researcher wants to know whether older adults have more difficulty in noise than do younger adults. She has two age groups (older and younger adults) and three levels of noise (none, 0db SNR, -10 dB SNR).

2. Are there cross-linguistic differences in how children perform in a form-based priming task? Children speaking French, Japanese, and English took part in this study; they were asked to listen to pairs of nonwords and repeat back the second item they heard. (All kids heard the same items, and they were not real words in any of the three languages, although they were pronounceable.) Their reaction times to repeat back the item were measured. On some trials, the first item and the second item of the pair were identical (i.e., the first item primed the second). This should speed up processing the 2<sup>nd</sup> item, but does this happen the same way in different languages?

3. Studies have found that, when listening in noise, people do better at identifying high frequency words than low frequency words. A researcher wants to know whether older adults’ show a greater word frequency effect than younger adults, particularly at greater noise levels (that is, are older adults more likely to depend on word knowledge as the task gets harder). She has two age groups (older and younger adults), three levels of noise (basically amounting to no noise, moderate noise, and lots of noise), and two sets of words (words high in frequency and low in frequency).

4. A researcher wants to examine whether temporal processing ability is impaired in children with dyslexia. She develops a test of gap detection with gaps of three different lengths, and looks at accuracy to detect the gap. She examines children with dyslexia on this test.

5. A national cookie manufacturer wonders whether it is worthwhile making special holiday cookies (ones cut into holiday-relevant shapes). The company decides to do a 2-year study. During the first year, they only make their basic cookie shape, and they measure cookie sales during three holiday-related time periods: around Easter, around Halloween, & around Christmas. The second year, they measure cookie sales for the same 3 time periods, but they make different shaped cookies: Egg & chick shaped for Easter, Pumpkin shaped for Halloween, and Tree & Bell shaped for Christmas.

6. The major TV networks are having their ratings wars to see which network has the most viewers. An independent agency is monitoring viewer-hours for each of four networks (ABC, NBC, CBS, Fox) during a 4-week span. As a secondary question, they are also interested in whether particular networks attract different types of viewers – so they are also evaluating the gender and age group (child, teen, young adult, middle-aged adult, older-adult) of viewers.