Experimental Results Worksheet
BIOL 01104 Fall 2019, Dr. Spielman

We have previously discussed the two experimental scenarios given below. For each scenario, several options for experimental results are provided.
For each potential result, determine if the results **support** the alternative hypothesis, or if the results **fail to support** the alternative hypothesis.
Importantly, some of the results might be **inconclusive** (note, inconclusive results fail to support the alternative hypothesis) - in fact, many (most) real scientific experiments are inconclusive, so there is always more science to do.

Hypothesis: Thyroxin (a thyroid hormone) release triggers amphibian metamorphosis.
Researchers collect 100 tadpoles. They randomly place fifty tadpoles into a tank with just water, and they place the other fifty tadpoles into a tank with thyroxin. After four days, they count how many tadpoles have undergone metamorphosis in each tank.

Result #1:

Experimental Groups	**Percent metamorphosing**
Thyroxin	85%
Water (no thyroxin)	5%

support

Result #2:

Experimental Groups	**Percent metamorphosing**
Thyroxin	55%
Water (no thyroxin)	25%

fail to support or support (argument either way)

Result #3:

Experimental Groups	**Percent metamorphosing**
Thyroxin	35%
Water (no thyroxin)	35%

fail to support

Result #4:

Experimental Groups	**Percent metamorphosing**
Thyroxin	4%
Water (no thyroxin)	3%

fail to support

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Hypothesis: Acetylcholine stimulates muscle contraction.
Researchers prepare fifty identical replicate cell cultures of muscle fibers. They randomly divide these cultures into five groups with 10 dishes each. Three of the groups are treated with an acetylcholine solution of a different concentration. The fourth group receives a treatment of the solvent without acetylcholine, and the fifth group receives no treatment.

Result #1:

Experimental Groups	Percent contracting
Acetylcholine, low concentration	12%
Acetylcholine, medium concentration	25%
Acetylcholine, high concentration	38%
Solvent only	2%
No treatment	1.8%

Support. also concentration matters.

but different interpretation!

Result #2:

Experimental Groups	Percent contracting
Acetylcholine, low concentration	58%
Acetylcholine, medium concentration	56%
Acetylcholine, high concentration	57%
Solvent only	2%
No treatment	3%

Support - does not seem that concentration matters

Result #3:

Experimental Groups	Percent contracting
Acetylcholine, low concentration	58%
Acetylcholine, medium concentration	56%
Acetylcholine, high concentration	61%
Solvent only	48%
No treatment	49%

fail to support

(could be weak support)

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Result #4:

Experimental Groups	Percent contracting
Acetylcholine, low concentration	5%
Acetylcholine, medium concentration	8%
Acetylcholine, high concentration	6%
Solvent only	82%
No treatment	64%

fail to support (maybe acetyl. suppresses?)

Result #5:

Experimental Groups	Percent contracting
Acetylcholine, low concentration	79%
Acetylcholine, medium concentration	78%
Acetylcholine, high concentration	81%
Solvent only	85%
No treatment	2%

fail to support

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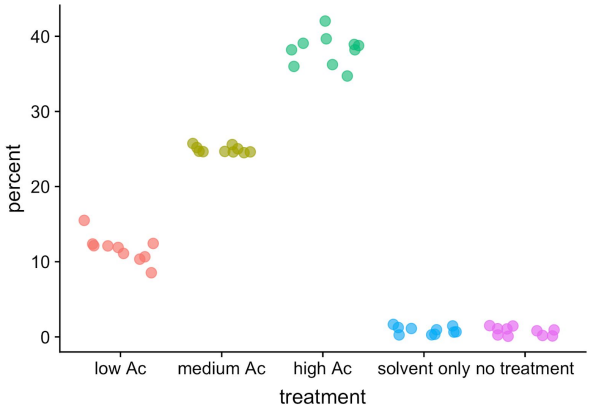
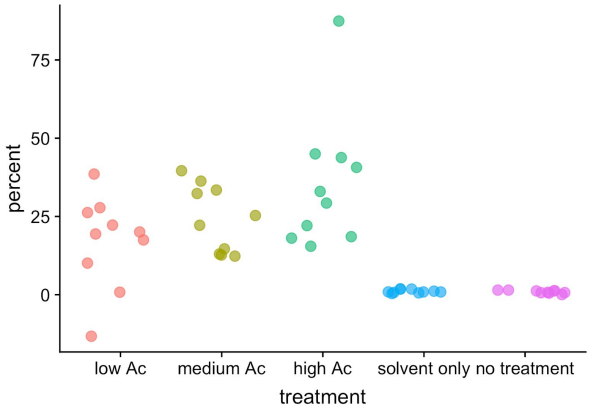
Consider these graphs as you considered the tables: Each point represents a single measurement from each treatment/control group. The X-axis shows your experimental groups, and the Y-axis shows the percent of contracting fibers.

Result #6:



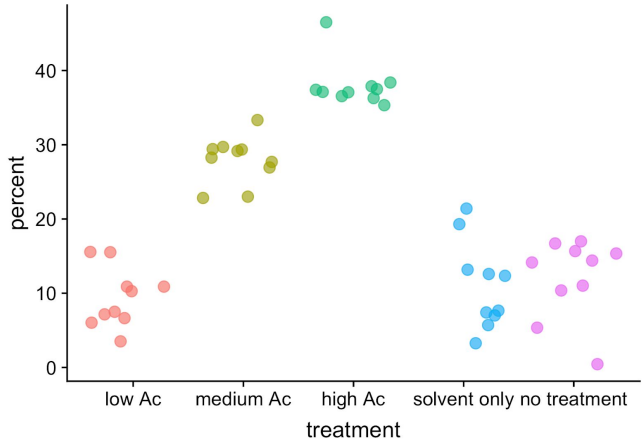
support

Result #7:



support

Result #8:



support (w/ need for higher concentrations)