

Binomial Example: Testing Psychic Abilities Using statistics

“Remote Viewing” developed as
part of classified government
program called “Stargate”



Psi/Psychic/ESP/Anomalous Cognition

Having information that could not have been gained through the known senses.

- **Telepathy**: Info from another **person**
- **Clairvoyance**: Info from another **place**
- **Precognition**: Info from the **future**
- **Correlation**: Simultaneous access to info

For **proof** -> Source **isn't** important.

For **explanation** -> Source **is** important.



Controlled Experiments to Test Psychic Abilities

Crucial elements:

1. Safeguards to rule out cheating or ordinary means of communication
2. Knowledge of probabilities of various outcomes by chance alone

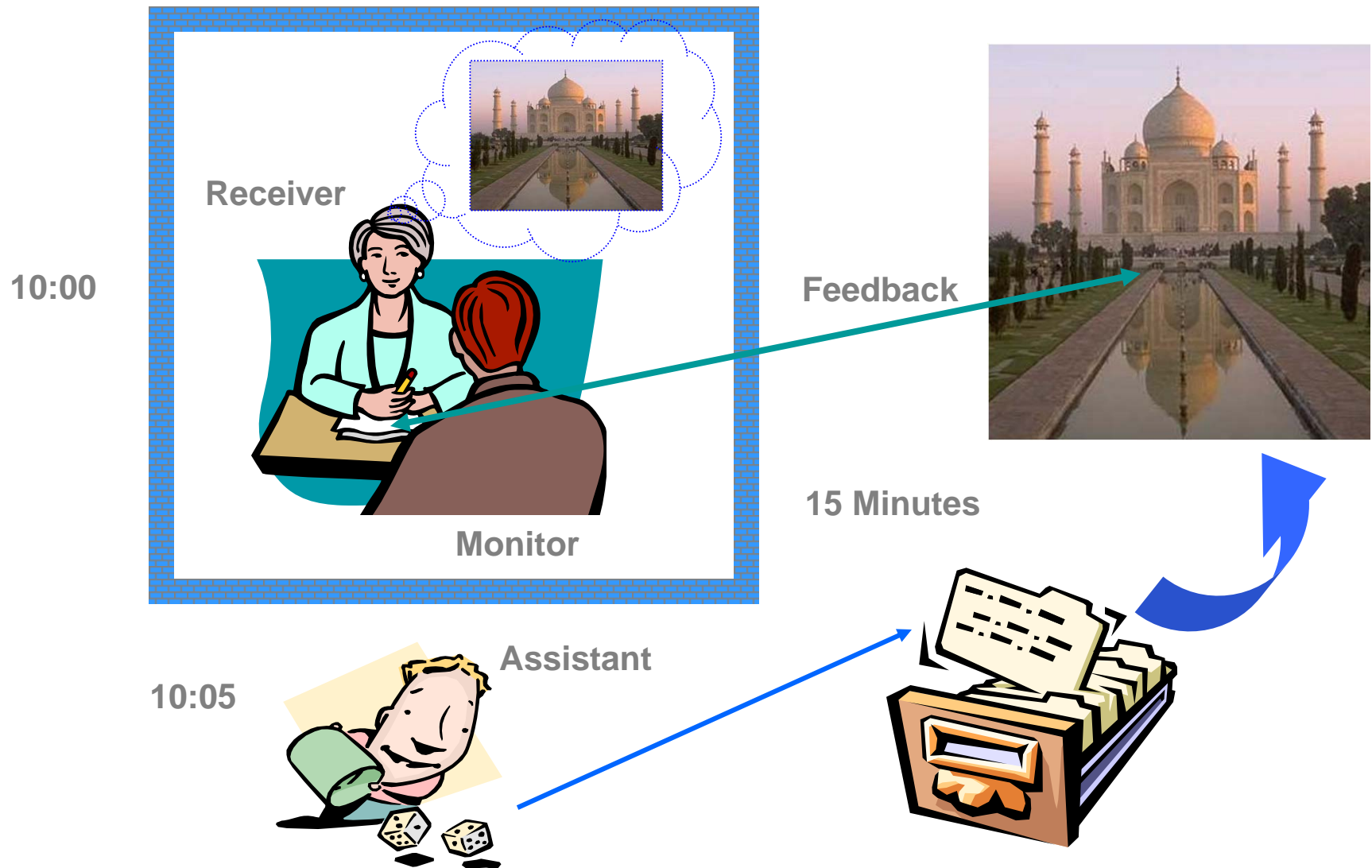
Examples... are these okay?

1. I am thinking of a number from 1 to 5. Guess it.
2. My assistant upstairs has shuffled a deck of cards (well!) and picked one. What suit is it?

Examples of *forced choice* experiments. Have someone guess n times. Can be analyzed using binomial distribution.

Remote Viewing Protocol

Meets condition #1 (safeguards)

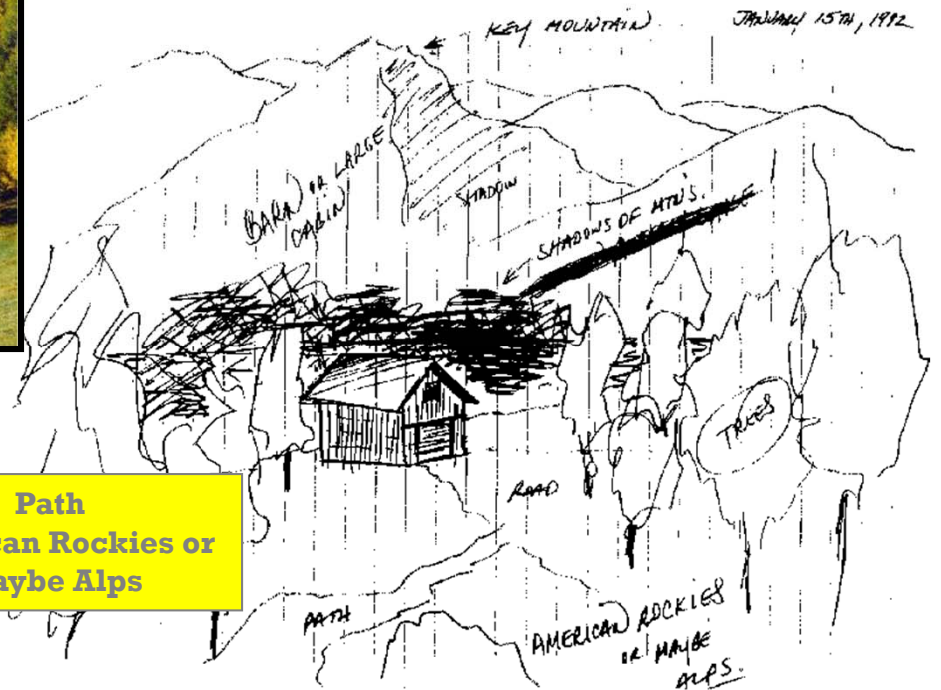


Example of an Amazing Match

(Experiment at SAIC/Stanford)



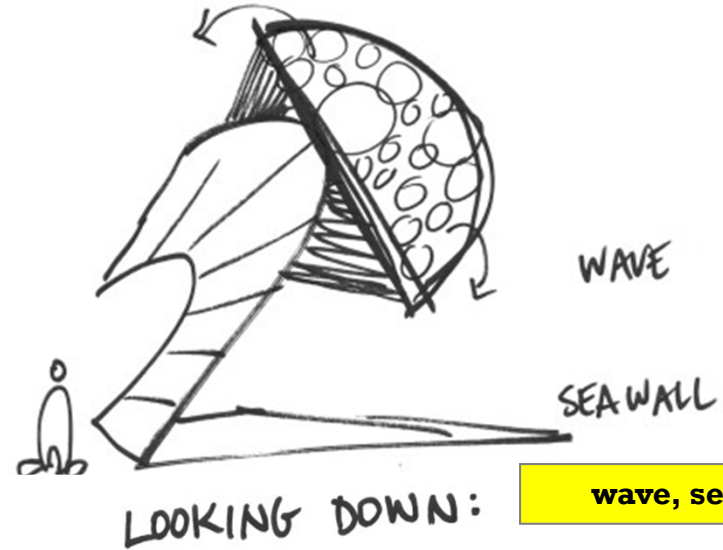
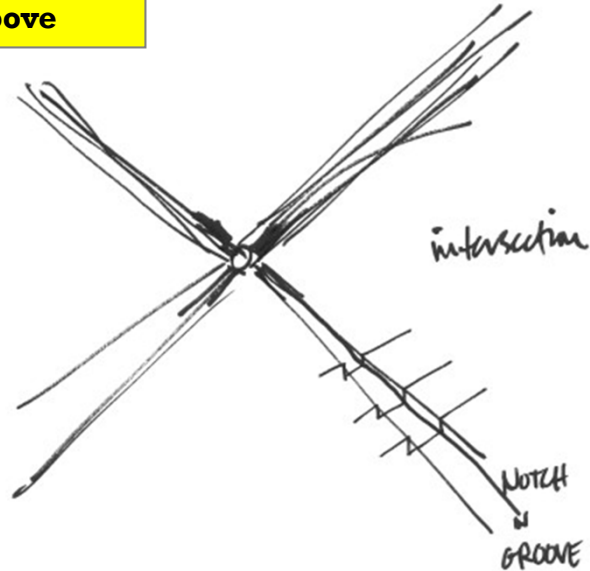
Key Mountain
Barn or Large Cabin
Shadow
Shadows of Mtns.
Trees
Road



Path
American Rockies or
Maybe Alps

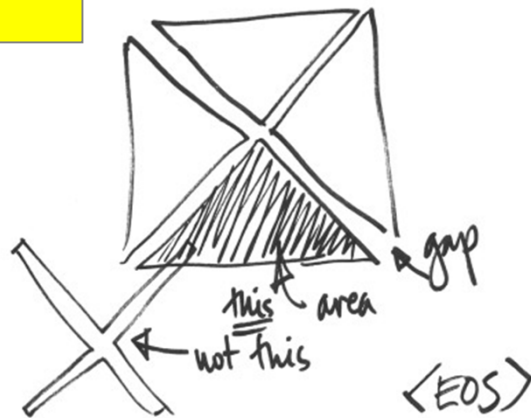
Typical Response – Novice (Recent Experiment)

intersection,
notch, groove

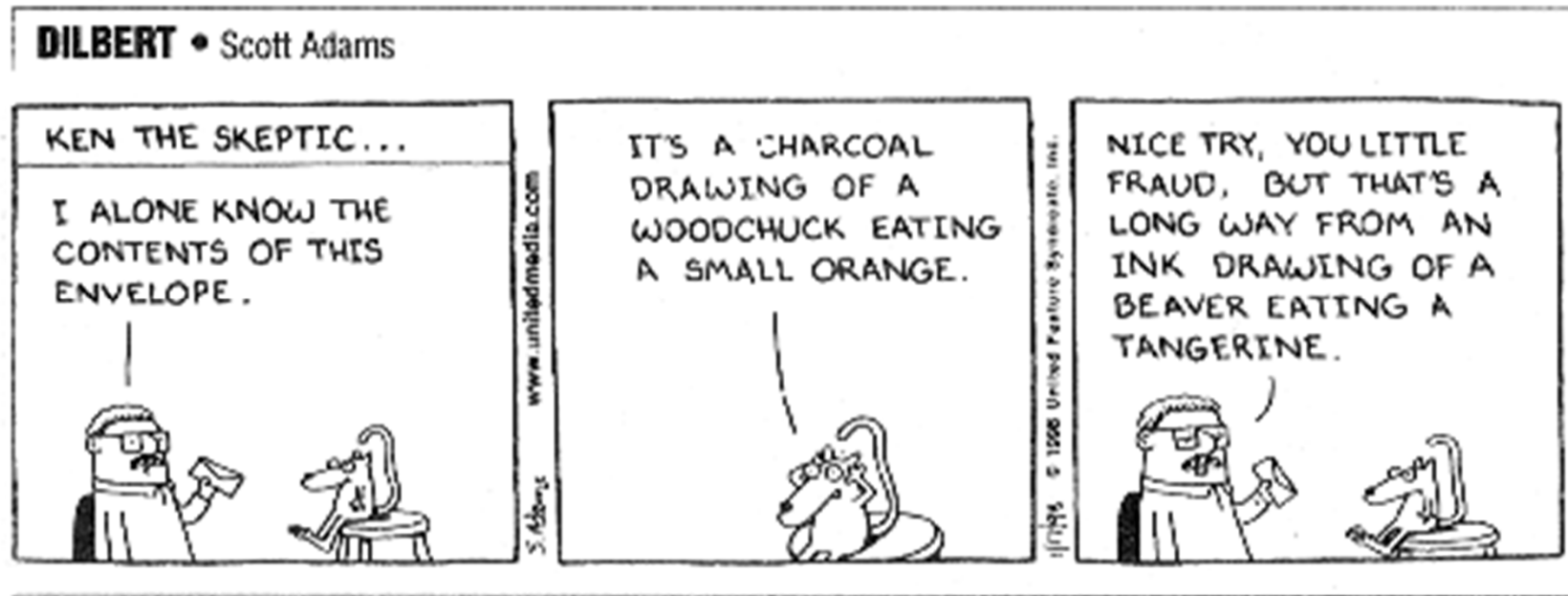


wave, sea wall

gap

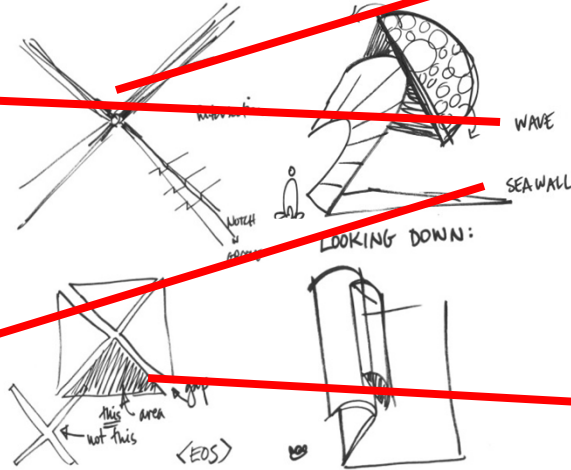
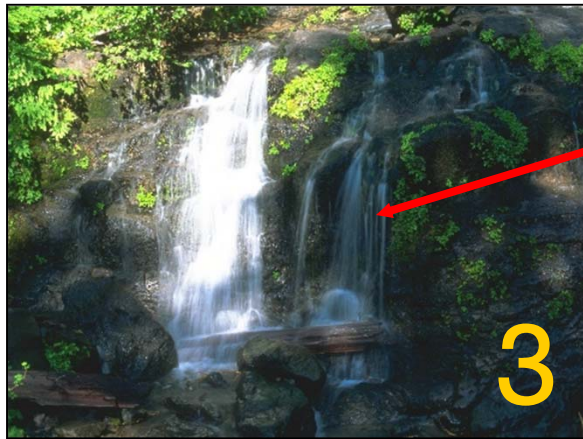


How NOT to Judge the Response



Can't use subjective match – too much room for personal bias.

Rank-Order Judging





An Experiment has many Sessions

- Before the *experiment*, a “target pool” is created - many packs of 4 dissimilar sets of photos (or short videos).
- Before each *session* begins a pack of 4 is randomly selected, then target within it (e.g. windmills). The *session* takes place, producing a response.
- After the *session*, a judge is given the response and the 4 choices from that target pack. Judge must assign the 4 ranks (and is of course blind to correct answer).
- For each *session*, result = the *rank* assigned to correct target, *or* “direct hit” if it gets 1st place rank.
- *We will look at direct hits only, which is binomial.*



Experiments, Sessions, Probability

- Summary statistic for entire *experiment* (many *sessions*):
 - n = number of sessions.
 - *By chance*, p = probability of “direct hit” = $1/4$
 - X = number of direct hits, X is binomial
- Meets **Condition #2**:

Knowledge of **probabilities** of various outcomes by chance alone.



Statistical Analysis

- We can test null & alternative hypotheses:

Null: Chance alone can explain results

Alternative: At least some participants can guess at better than chance

Suppose an experiment has n sessions, k hits

- P-value = probability of at least k successes in binomial $n, \frac{1}{4}$
- Can also get confidence interval for true p

P-value and C.I. Results of Free Response Experiments (for 1995 report for Congress)

Hit rates assume there were *four* choices;
chance = 25%

U.S. Government Studies in Remote Viewing:

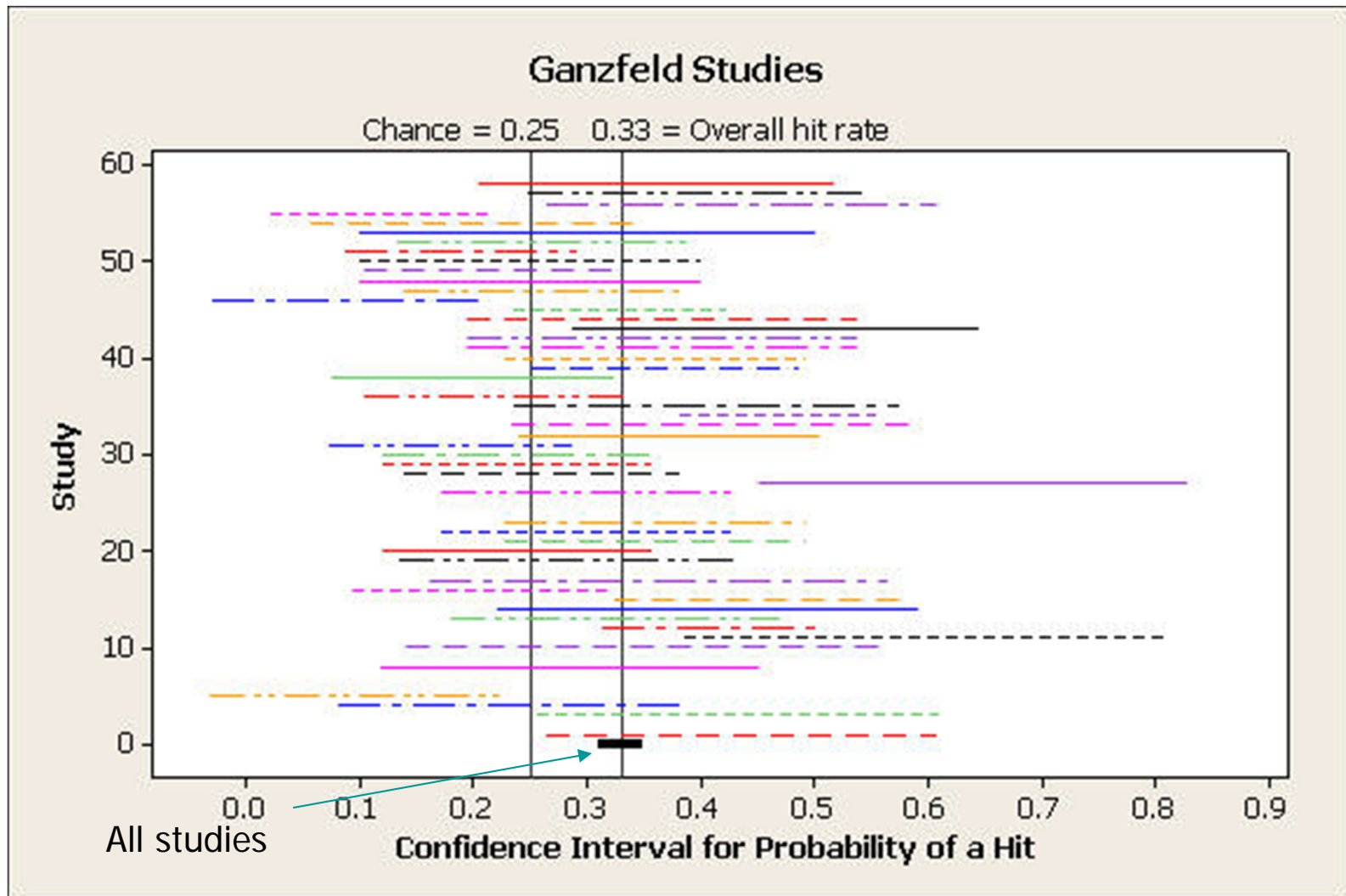
- SRI International (1970's and 1980's)
n = 966 trials, k = 329, so 34% hits
p-value = 4.3×10^{-11} , 95% C.I. 31% to 37%
- SAIC
n = 455 trials, k = 160, so 35% hits
p-value = 5.7×10^{-7} , 95% C.I. 30% to 40%

More results from 1995 review

Ganzfeld experiments (similar to remote viewing):

- Psychophysical Research Laboratories, Princeton
n = 355 trials, **hit rate = 34.4%**,
p-value = .00005, C.I. 29.4% to 39.6%
- University of Amsterdam, Netherlands (1990's)
n = 124 trials, **hit rate = 37%**,
p-value = .0019, C.I. 29% to 46%
- University of Edinburgh, Scotland (1990's)
n = 97 trials, **hit rate = 33%**,
p-value = .0476, C.I. 25% TO 44%
- Rhine Research Institute, North Carolina (1990's)
n = 100 trials, **hit rate = 33%**,
p-value = .0446, C.I. 24% to 42%

More Recent Analysis of 58 Studies,
Overall hit rate = 33% (chance = 25%)



Online Tests

<http://www.gotpsi.org>

Has a “quick remote viewing” test where you are shown 5 pictures, and asked which one you think is the correct answer.

Also has various card guessing tests, mostly based on binomial.