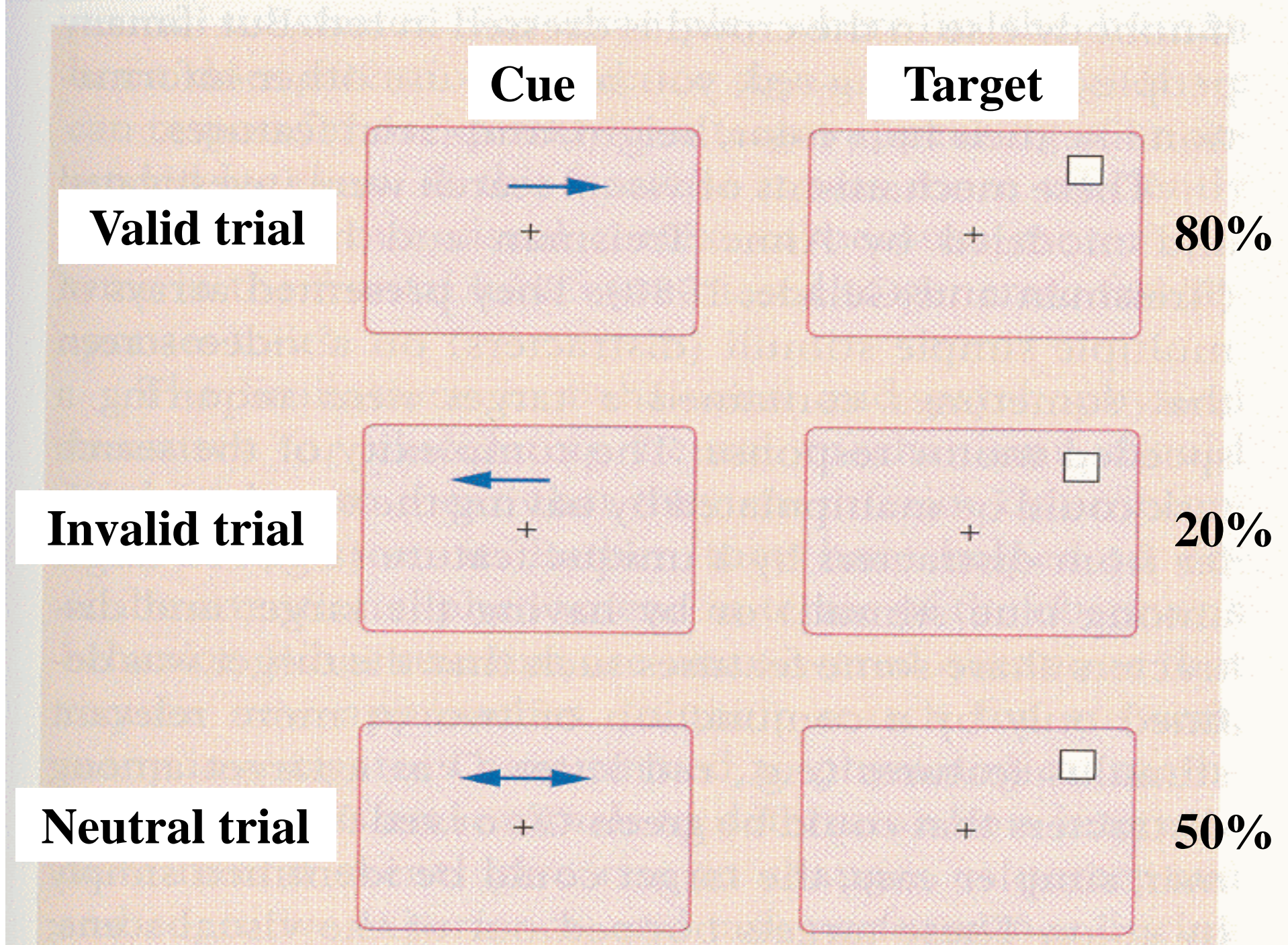


The Cueing Task (Posner, 1980)

-Detect a target that can appear in one of two locations

-A cue appears beforehand giving the observer the likely location of the target

-Valid cues typically lead to better and faster performance



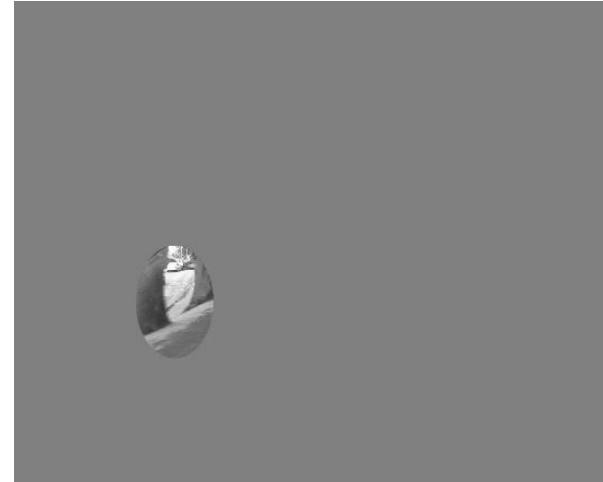
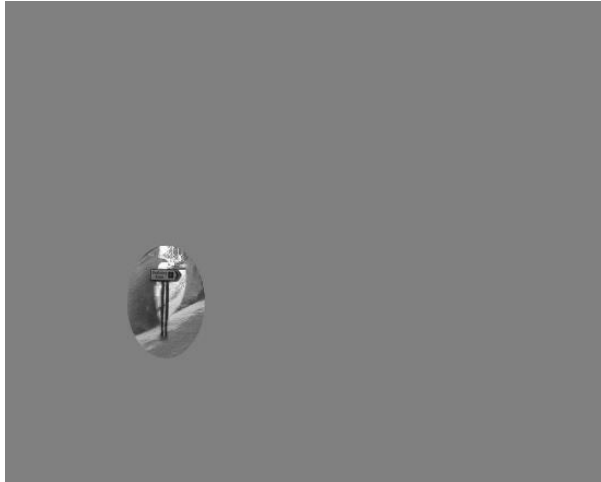
3. Assess if the users employ the expectancy information

Control conditions to account for size and location differences

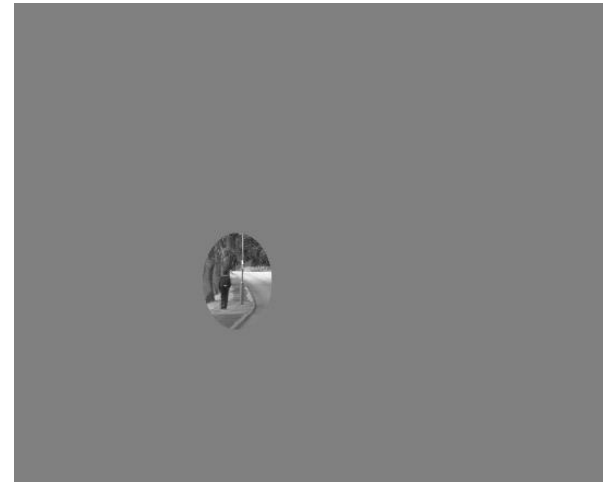
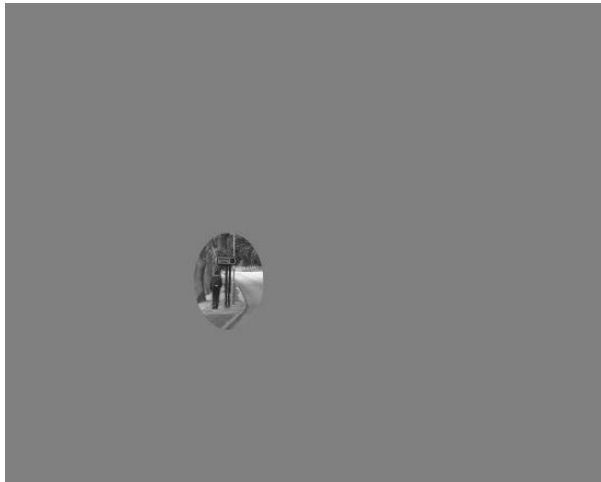
Target present

Target absent

High expectation



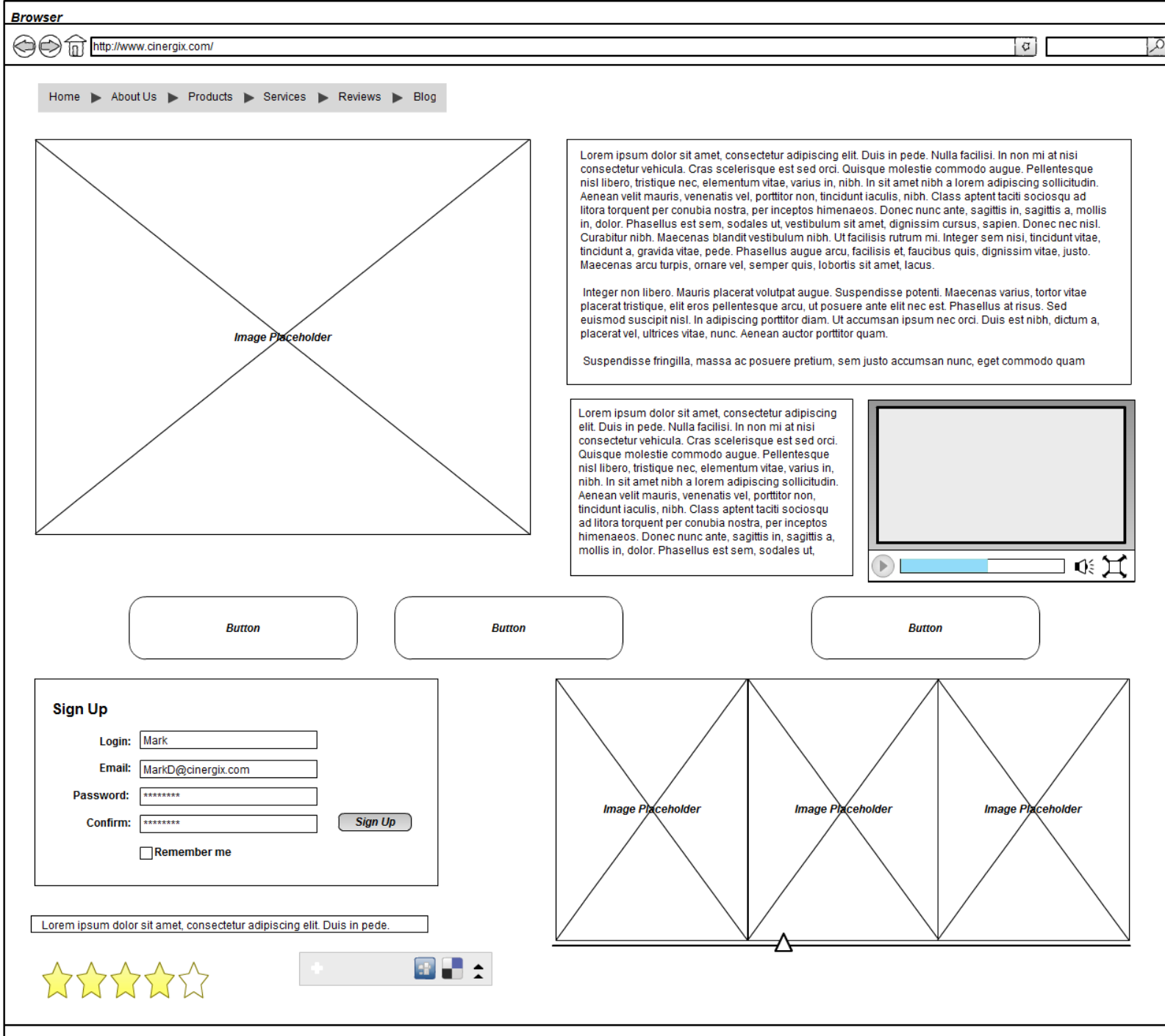
Low expectation



Applied to webpage design

Proposal: make web browsing more efficient by placing information where users expect it

1. Assess the expectancies of users: locations of key links, e.g., 'Shopping Cart', 'Recommended'
 - Perhaps online, as in the driving study
 - Or, through eye-tracking
2. Adjust the visual layout to account for the expectancies:
 - Place links in expected (vs. default) locations
3. Assess if the users employ the expectancy information
 - Google Analytics (average time on website)
 - A/B testing



Imagine this is a website to buy an electronic device, say a laptop.

Where would you expect to find the place to click for the specifications for the laptop?

Where would you expect to find the place to click put the item in the Shopping Cart?

Where would you expect the place to click to see accessories for the laptop that you might want?

Bayesian model

Image with 2 assumed
relevant locations



Observer judges if
the target is in the
display, yes or no

Assume a response
for each location

x_{low} , x_{high}

Compute the posterior
probability of
signal presence (S_1) for
each location

$p(S_{1, low} | x_{low}, x_{high})$,
 $p(S_{1, high} | x_{low}, x_{high})$

Apply Bayes' theorem to express as prior probabilities

$p(S_{1, low} | x_{low}, x_{high}) = p(S_{1, low}) p(x_{low}, x_{high} | S_{1, low})$

$p(S_{1, high} | x_{low}, x_{high}) = p(S_{1, high}) p(x_{low}, x_{high} | S_{1, high})$



Compute ratio of overall posterior probability of signal presence (S_1)
and overall posterior probability of signal absence (S_0)
$$[p(S_{1, low} | x_{low}, x_{high}) + p(S_{1, high} | x_{low}, x_{high})] / p(S_0 | x_{low}, x_{high})$$



Compare ratio to a criterion (ideal criterion is $p(S_1)/p(S_0)$)
Respond 'yes' if ratio \geq crit
Respond 'no' if ratio $<$ crit