

# Quick Introduction to Psychology

Thr, July 23 (Week 5.5)

# Brief Introduction to Experimental Psychology

The most popular approach these days:

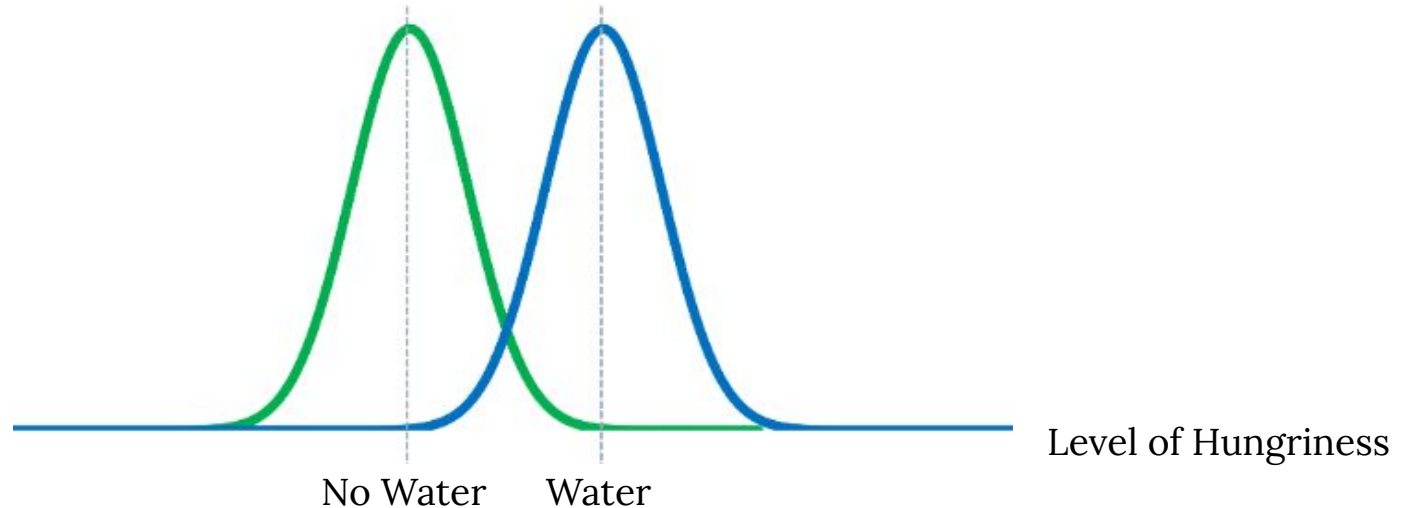
Manipulated Variables -> Statistical Model -> Observed Variables

Example:

Make people drink or not drink water (manipulated variable) and ask how much hungriness do they feel (observed variable).

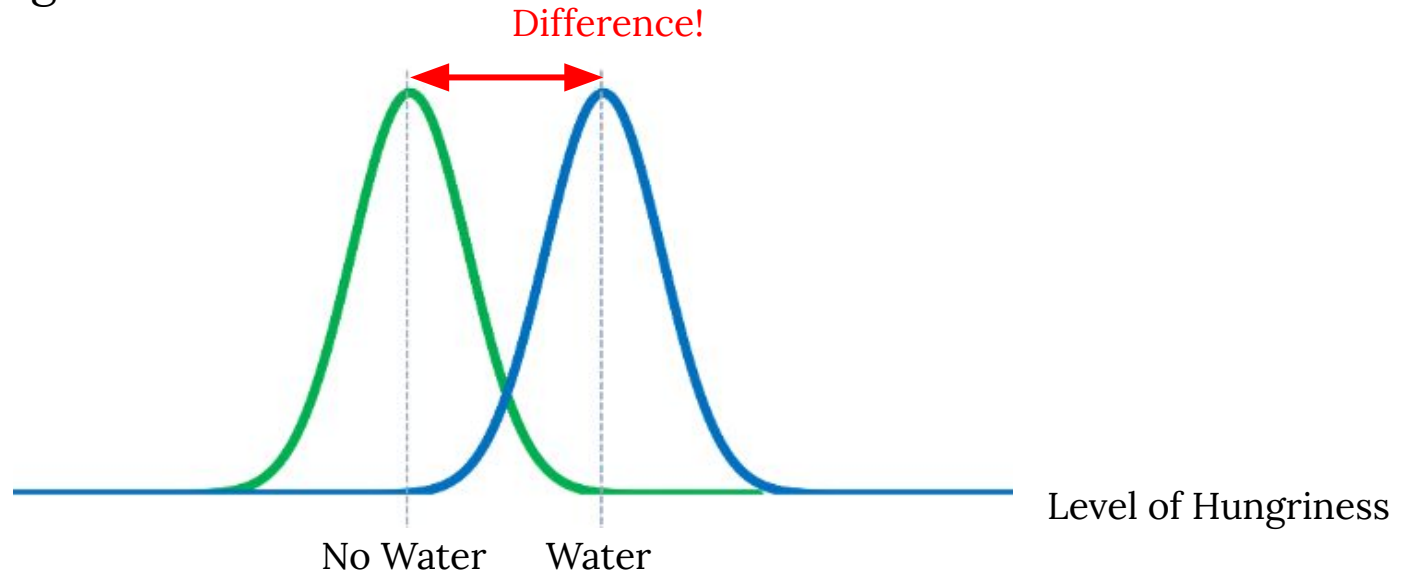
# Brief Introduction to Experimental Psychology

For example, use a statistical model that assumes the level of how much hunger people feel is quite similar between people of the same condition, in other words, follows a normal distribution, to describe the observations.



# Brief Introduction to Experimental Psychology

Discuss about the *difference* between the observations from different conditions, for example, whether drinking water makes a person feel hungry in a statistically significant amount.



# Another Representation of the Water Example

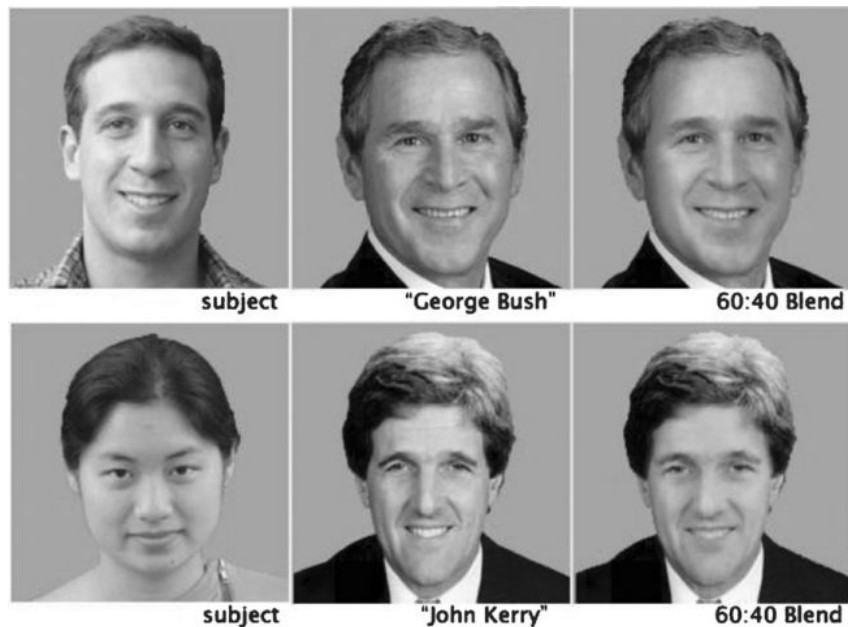
The Model:



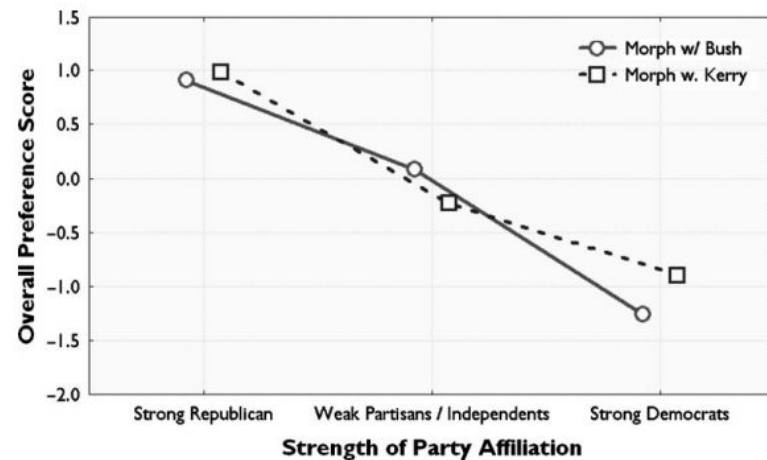
The Question:

Does this arrow exist (in a statistically significant way)?

# Example of an Experiment

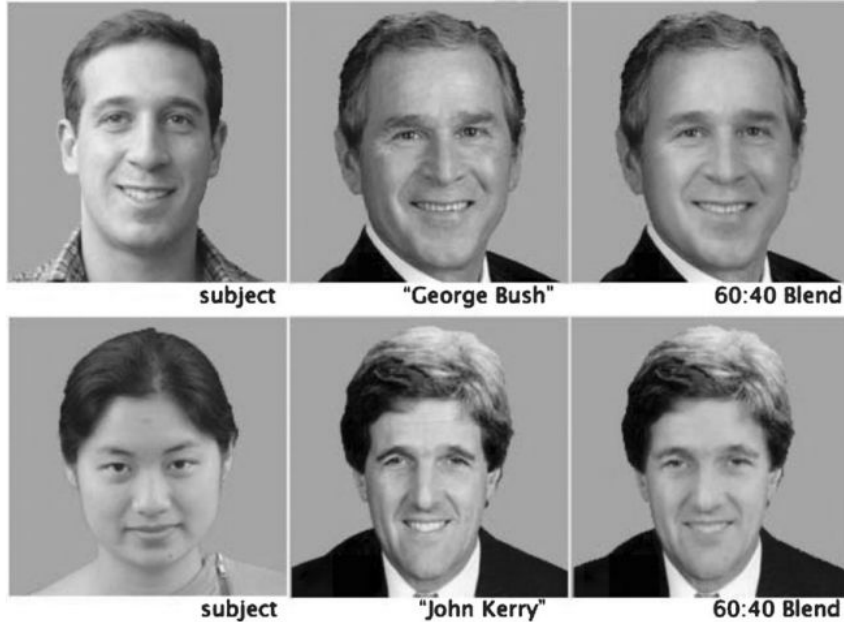


**Figure 2.** An Example of Two Subjects from Experiment 2, One Morphed with Bush and One Morphed with Kerry. Participants Saw the Two Images

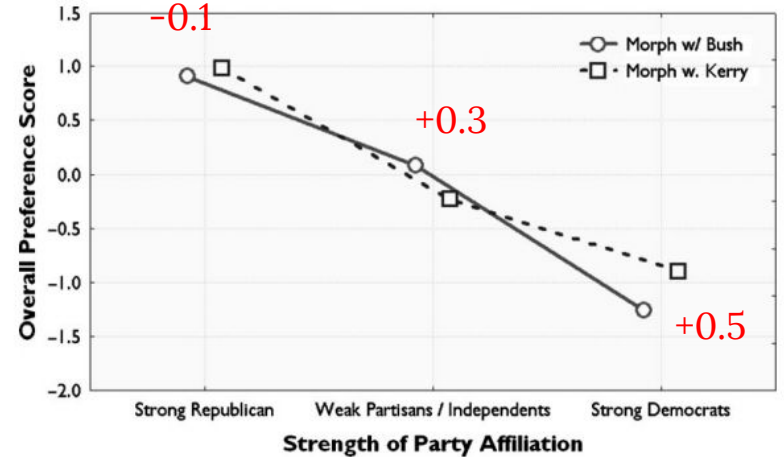


**Figure 3.** The Effects of Facial Similarity and Party Affiliation on Candidate Preference Score in Experiment 2. Higher Scores Indicate More Support for Bush.

# Example of an Experiment



**Figure 2.** An Example of Two Subjects from Experiment 2, One Morphed with Bush and One Morphed with Kerry. Participants Saw the Two Images



**Figure 3.** The Effects of Facial Similarity and Party Affiliation on Candidate Preference Score in Experiment 2. Higher Scores Indicate More Support for Bush.

Morph w/ Bush did +0.3 compared to Morph w/ Kerry in average.

# Example of an Experiment





# Definition of Social Psychology

[Social psychology is] an attempt to understand and explain how the thought, feeling, and behavior of individuals are influenced by the actual, imagined, or implied presence of others. (Gordon Allport, 1954)

Originally, the word “others” includes people.

For AR/VR, the word “others” includes virtual humans.

# The Grand Question for Virtual Humans

Are virtual humans (perceptually) different from people?

According to the media equation, yes.

But the media equation is about media having the same direction of the psychological effects, such as making people follow social norms. Would the intensity also be the same--would people show same level of politeness?

# The Better Version of the Grand Question

According to the social influence theory and common sense, higher the presence level, the more similar the virtual humans will be.

Which level of presence from virtual humans lead to which level of behavioral change from people and which level of perceptual similarity between real and virtual human does that imply?

# Proxemics (Personal Space)

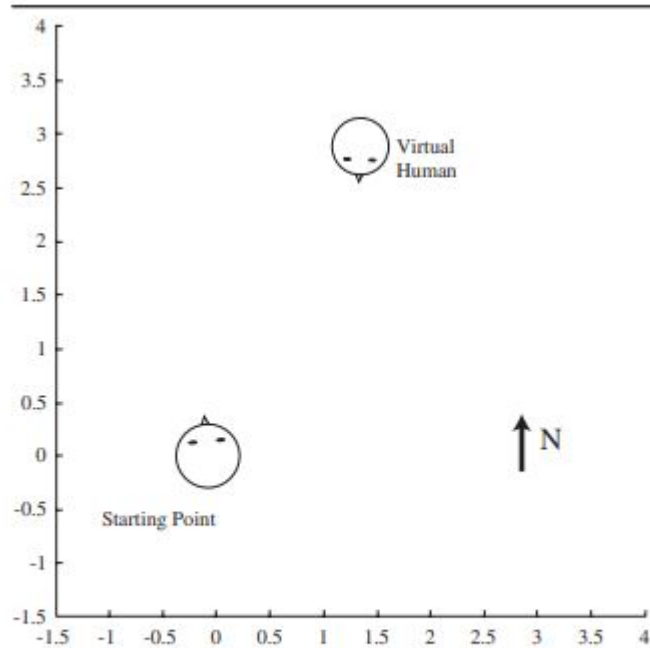
People do not stay too much close to each other, and the distance that makes people feel too much is based on their social relationship.

In general, the distance is the largest between strangers and the closest between significant others.

Important catch for AR/VR researchers:

People are okay right next to, for example, a rock they have never met before in life, while they do not prefer such behavior for an equivalent person.

# VR Proxemics (Bailenson et al., 2003)



**Figure 3** A diagram depicting the relative locations of the virtual human and participants' starting point in the virtual room. The scale is in meters.



**Figure 4** A depiction of our virtual environment system.

NOTE: The components are (a) position tracking cameras, (b) head-mounted display (HMD) and orientation tracking sensor, and (c) image generator.

# VR Proxemics (Bailenson et al., 2003)

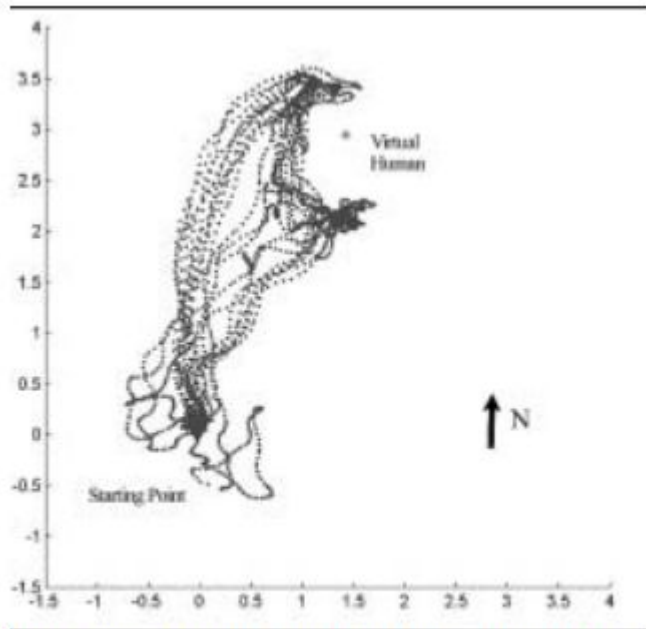


Figure 5 An example of the 10 paths from a typical participant as she walks from the starting point around the back of the virtual human, then in front of the virtual human, and then back to the starting point.

TABLE 1: Mean and Standard Deviation of Minimum Distance (in meters) Across Participant Gender, Gaze Behavior, and Agency

	<i>Female Participants</i>	<i>Male Participants</i>
No mutual gaze		
Agent	.34 (.14)	.38 (.20)
Avatar	.48 (.12)	.47 (.13)
Mutual gaze		
Agent	.43 (.16)	.54 (.18)
Avatar	.49 (.14)	.34 (.12)

# AR Proxemics (Lee et al., 2018)

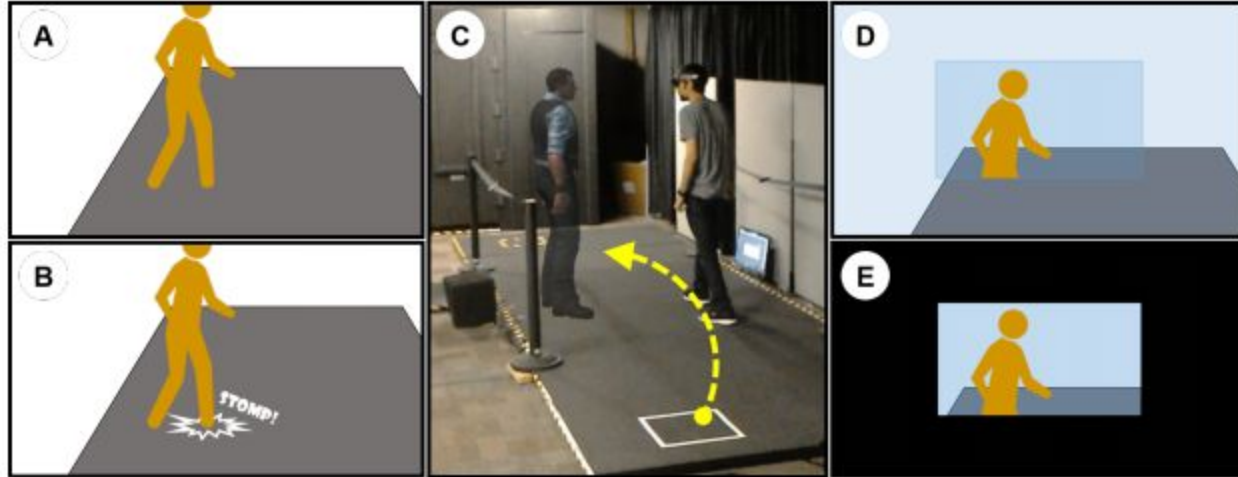


Fig. 1. Overview: Participants in our study performed a locomotion task while avoiding collisions with a real or virtual human obstacle (C). In this setting, we manipulated the virtual human's floor-based vibrotactile feedback (A: footsteps did not make any vibration, B: footsteps vibrated the platform); the user's visual field (D: both augmented central area and unaugmented periphery were visible, E: field of view was restricted to the augmented central area); and the behaviors of the human obstacle (standing, jumping, walking).

# AR Proxemics (Lee et al., 2018)

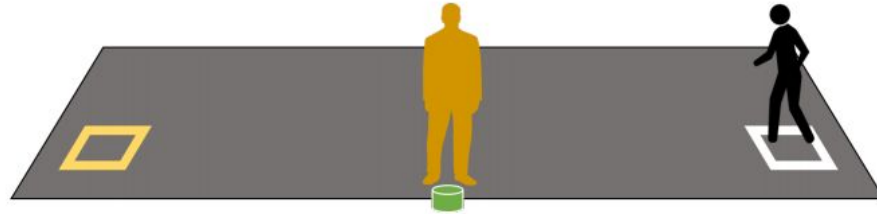


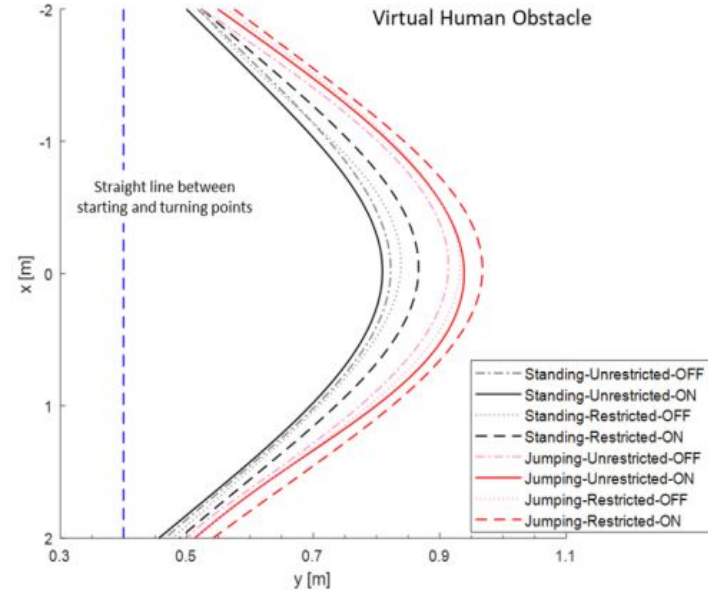
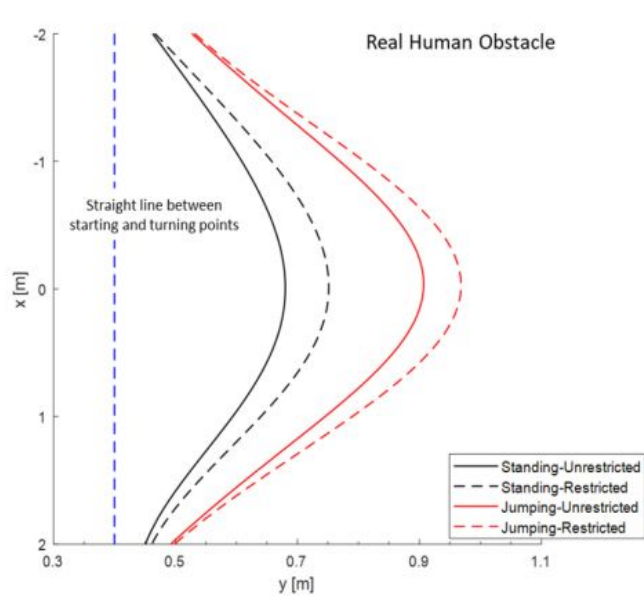
Fig. 2. Layout of the experimental platform: The white and yellow boxes represent the participants' starting position and the turning position,



Fig. 3. Obstacle behavior from left to right: (standing) the human stands and looks around idly, (jumping) the human jumps in place around 22 times/min, and (walking) the human walks back and forth along the shorter edge of the platform at .27 m/s.



# AR Proxemics (Lee et al., 2018)



# Lessons from Proxemics Studies

Important catch for AR/VR researchers:

People are okay right next to, for example, a rock they have never met before in life, while they do not prefer such behavior for an equivalent person.

As expected, higher realism of virtual humans did increase the size of personal space.

While the direction is not that much surprising, the numbers--the how much part--have value.