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Exocentric Distance Judgments in Computer Generated 2D Images
Laura Janosko
Advisor: Dr. Benjamin R. Kunz

Introduction:
- The quality and detail of computer graphics has been shown to influence distance judgments in interactive virtual environments.
- Kunz, et al. (2009) found that the quality of graphics influenced the accuracy of distance judgments in a 3-dimensional virtual environment.
- Cue Theory states that we combine depth cues (such as texture and shadows) in order to perceive depth (Cutting and Vishton, 1995).
- High quality graphics include important depth cues such as shadows and surface textures that may be missing in low quality graphics.
- The importance of shadows as a depth cue was demonstrated in a study by Hu, et al. (2002) that suggests the presence of shadows improved spatial judgment accuracy in interactive 2D images.
- The proposed experiment will investigate whether distance judgments between objects (exocentric) are more accurate in a high quality graphics condition than a low quality condition.

Method:
- Overview: Participant viewed high or low quality computer-generated versions of the desktop and objects shown below. They were asked to judge the distances between objects depicted in the computer-generated scenes.
- Materials: Each scene consisted of a computer-generated desktop and 5-10 computer-generated objects positioned on the desktop in various arrangements.
- Procedure: For each trial, participants will:
  - View a high or low quality scene
  - Be prompted to judge the distance between two objects
  - Verbally report the perceived distance using an arbitrary, standard unit

Predictions:
- Shadow and texture information are useful distance cues in 2-dimensional computer-generated images.
- Distance judgments will be more accurate when shadow and texture depth cues are available (high quality condition).

Results:
- No statistically significant difference between the means.
- Trending towards supporting our hypothesis.
- Changes could make enhance the differences between means.
- Make the scale a smaller portion of the desk.
- Have participants make different distance judgments in HQ and LQ trials.

Implications and Future Directions:
- Future studies will need to be conducted to see if shadow and texture information influence exocentric distance judgments in 2D images.
- Shadow and texture information may not effect distance judgments.
- Experiments conducted in 2D images may not apply to those in 3D virtual environments.
- Exocentric distance judgments may be influenced by different depth cues than egocentric distance judgments.
- Still no answers as to why participants were more accurate in Kunz, et al.’s (2009) experiment.
- Other secondary depth cues should be tested.

References: