How do cooperative communication mechanics impact gameplay?

We present a validation study of custom test chambers for a planned study of cooperative communication mechanics in Portal 2. The study suggests that the designed levels are of moderate difficulty and require communication.

**P2 Cooperative Communication Mechanics**

Cooperative Communication Mechanic. A game mechanic that enables information sharing and coordination by engaging with game systems without voice or text chat. [Toups et al. 2014]

In Portal 2, a first-person puzzle action game, players solve puzzles using a portal gun. The portal gun can connect two locations with a portal through which players or objects pass instantly.

In co-op mode, two players use two portal guns to complete challenging puzzles. CCMs enable communication.

Unbound Attention Focusing CCM: Look Ping: player points out a location in the game world.

Expressive CCM: (Cooperative) Gesture: player’s avatar acts out a gesture that includes the partner.

Semantically Imbued Attention Focusing CCM: Timer Ping: player points out a location with a countdown timer to synchronize action.

**On-Going Study Design**

We test CCMs in Portal 2 co-op gameplay by having subjects play three designed test chambers, using voice + CCM, voice only, and CCM only as conditions in a random order.

Hypotheses: Players will perform best with access to a combination of voice and CCMs; when used in isolation, CCMs will outperform voice only.

**Cooperative Communications: Scenarios**

Progression in test chambers requires cooperative communication for performing collaborative actions.

**Designed Test Chamber Validation**

Validation Study. We performed a validation study to assess designed test chamber difficulty. Three pairs of players, Portal 2 beginners, intermediates, and experts played 3 designed test chambers, selected from a pool of 9.

Findings. Subjects were asked to rate the test chambers’ difficulty: 1 (least difficult) to 10 (most difficult). Experts rated the test chambers as easy, intermediates as moderate, and beginners as difficult. This suggests we achieved the target difficulty level.