

Human-Computer Interaction  
**Computer-Mediated  
Communication**

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# Today's Agenda

- » Topic overview: *CMC*
- » Discussion
- » Project Activity: *Determining Method*

# Topic overview: CMC

# *What is CMC?*

**Definition:** Human communication via computers and includes many different forms of synchronous, asynchronous or real-time interaction that humans have with each other using computers as tools to exchange text, images, audio and video.<sup>1</sup>

*Why do we need so many theories to understand CMC?*

- » CMC is extremely diverse.
- » Technologies are ever changing.
- » Outcomes are sometimes counterintuitive.

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<sup>1</sup>Webopedia

# *What are CMC technologies?*

- » Email
- » Instant messaging
- » Text messaging
- » Social media
- » Hypertext
- » Internet forums, newsgroups, bulletin boards, distribution lists
- » Online learning
- » Online shopping
- » Phone conversations
- » Videoconferencing
- » Robot-mediated communication

*What are some characteristics of CMC technologies?*

- » Temporal structure of the communication:
  - » **Synchronous:** Face-to-face, videoconferencing
  - » **Asynchronous:** Email, forum discussions
  - » **Near-synchronous:** Instant messaging, text messaging
- » Social structure of the communication:
  - » **One-to-one:** Videoconferencing, email
  - » **One-to-many:** Blogs, online learning
  - » **Many-to-many:** Social media, chat rooms

**TABLE 7.1**  
**Technologies and Their Affordances**

<i>Affordance</i>	<i>Interactivity</i>	
<i>Mode</i>	<i>Interactive</i>	<i>Noninteractive</i>
Linguistic	Phone, audioconference, chat, instant messaging	E-mail, answerphone, voicemail, FAX, letter, Usenet
Linguistic and visual	Videoconference, video- phone, shared workspace	Videomail

<sup>2</sup>Whittaker, 2003, Theories and methods in mediated communication

**TABLE 7.2**  
**Effects of Different Affordances on Communication Behaviors and Processes**

<i>Affordance Type</i>	<i>Communication Behaviors Affected by Affordance</i>	<i>Core Communicative Phenomena Affected</i>
<b>VISUAL MODE</b>	Facial expressions	Attention, understanding, agreement
	Head nods	Conveying affect, attitude
	Gaze	Attention, understanding, agreement Turn taking
	Gesture	Attention Turn taking, reference
	Visual access to objects in a shared physical environment	Conveying affect, attitude
	Physical presence	Attention Turn taking, reference Reference, attention
<b>INTERACTIVITY</b>	Feedback via backchannels, completions, interruptions	Availability and initiation of impromptu conversation Attention, understanding, agreement Turn taking, reference, repairs Socioemotional feedback

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<sup>2</sup>Whittaker, 2003, Theories and methods in mediated communication

*What are some CMC theories?*

*Why do we need so many theories to understand CMC?*

- » CMC is extremely diverse.
- » Technologies are ever changing.
- » Outcomes are sometimes counterintuitive.

## *Deficit vs. Compensation Views*

**Deficit view:** The medium imposes restrictions on communication, and the resulting communication necessarily involves certain *deficits* that require communicators to manage.

**Compensation view:** People adapt to the restrictions media may impose on communication to *compensate* for the potential deficits, even often using it to their advantage.

## *An example **deficit** theory*

Media Richness Model (the Bandwidth Hypothesis); Social Presence Theory

E.g., the *Bandwidth hypothesis* posits taht the closer the modes supported by a technology correspond to those of FtF communication, the more efficient the communication with that technology.

## *An example **compensation** theory*

Social Information Processing (SIP) Theory; Social Identity/ Deindividuation (SIDE) Theory

E.g., *Social Information Processing Theory* posits that communicators exchange social information through the content, style, and timing of verbal messages on-line. People use platform affordances to make up for missing cues.

- » Walther (1993)<sup>3</sup> example shows FTF and CMC groups following different trajectories but arriving at similarly detailed impressions of group members.

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<sup>3</sup>Walther, 1993, Impression development in computer-mediated interaction

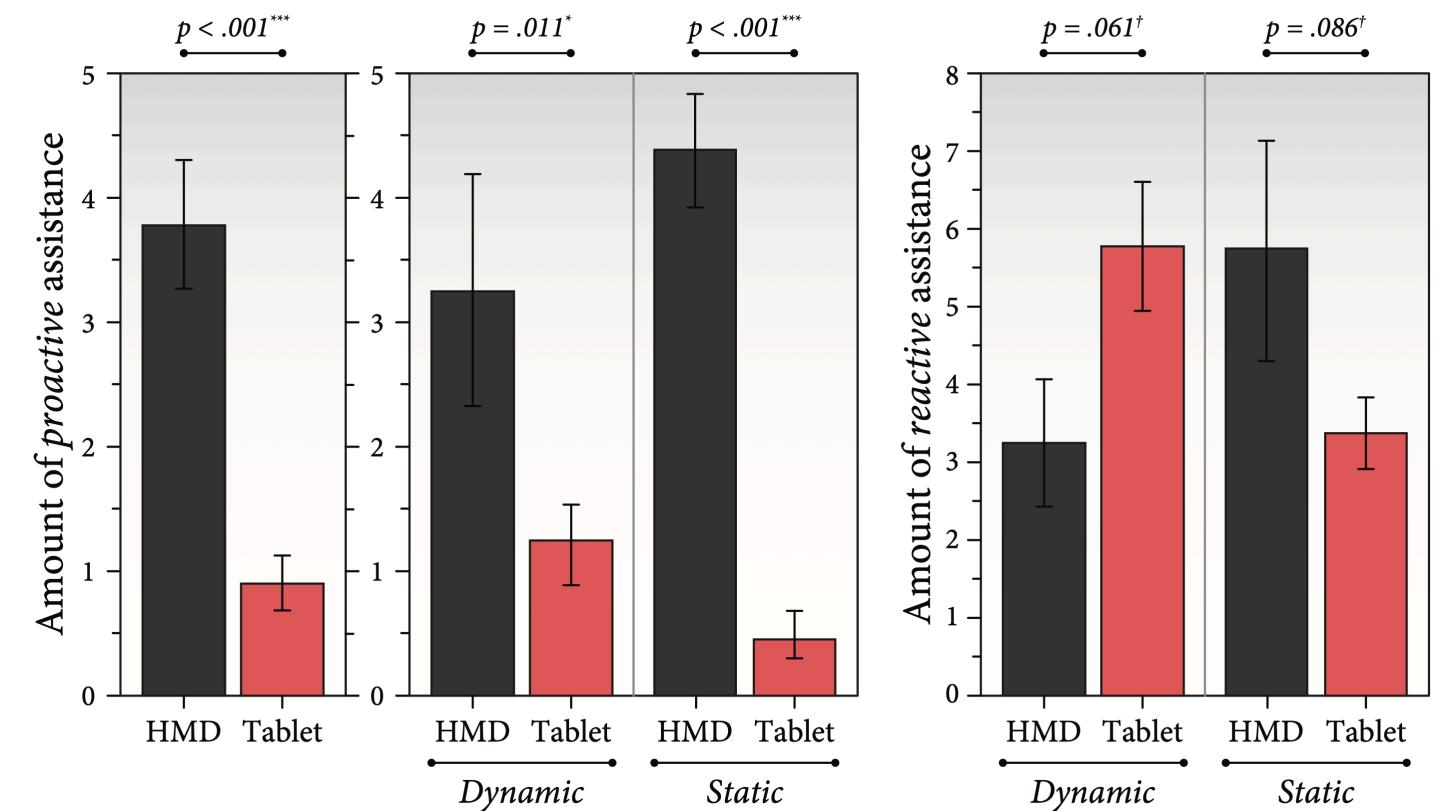
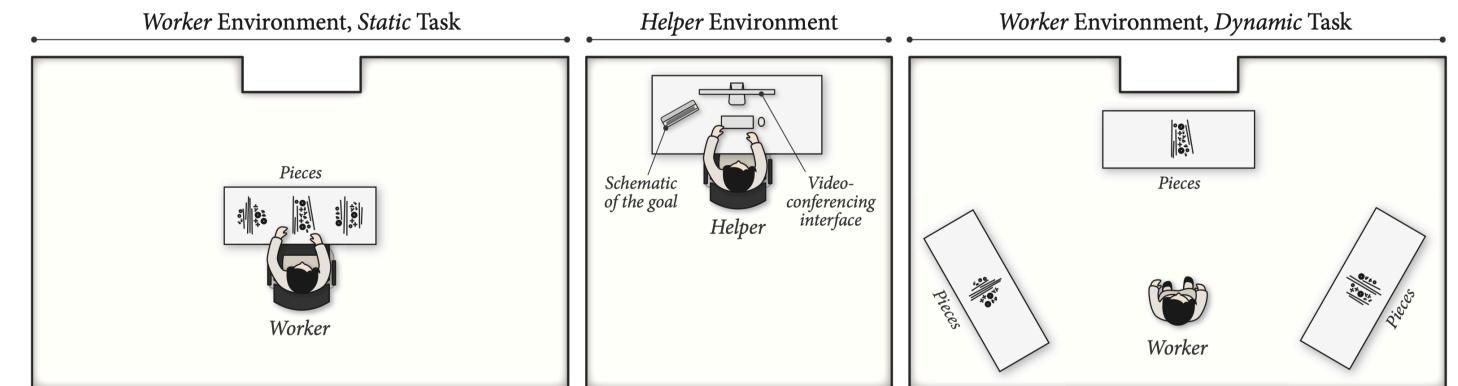
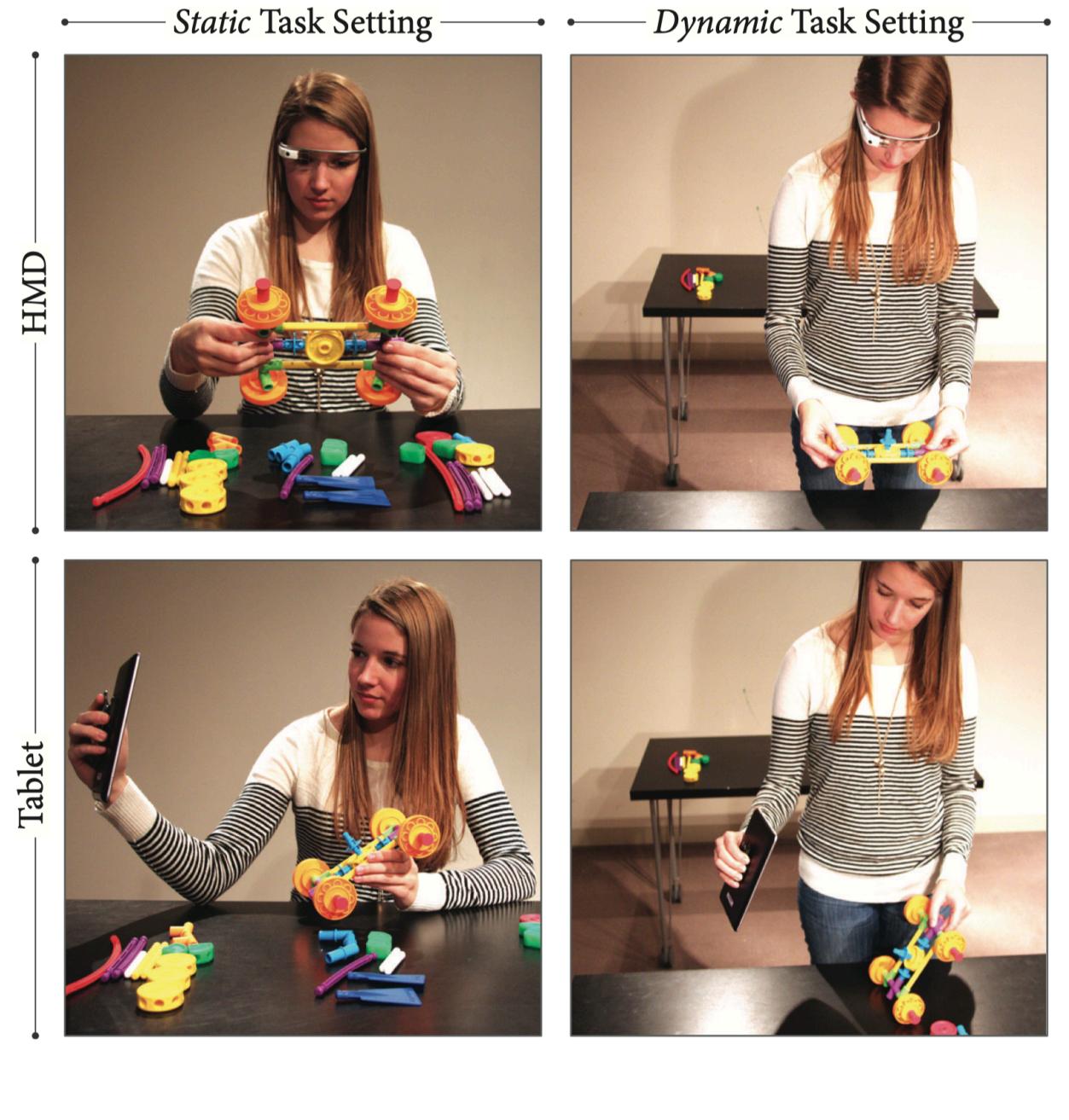
# *What are some newer forms of CMC?*<sup>4</sup><sup>5</sup><sup>6</sup>

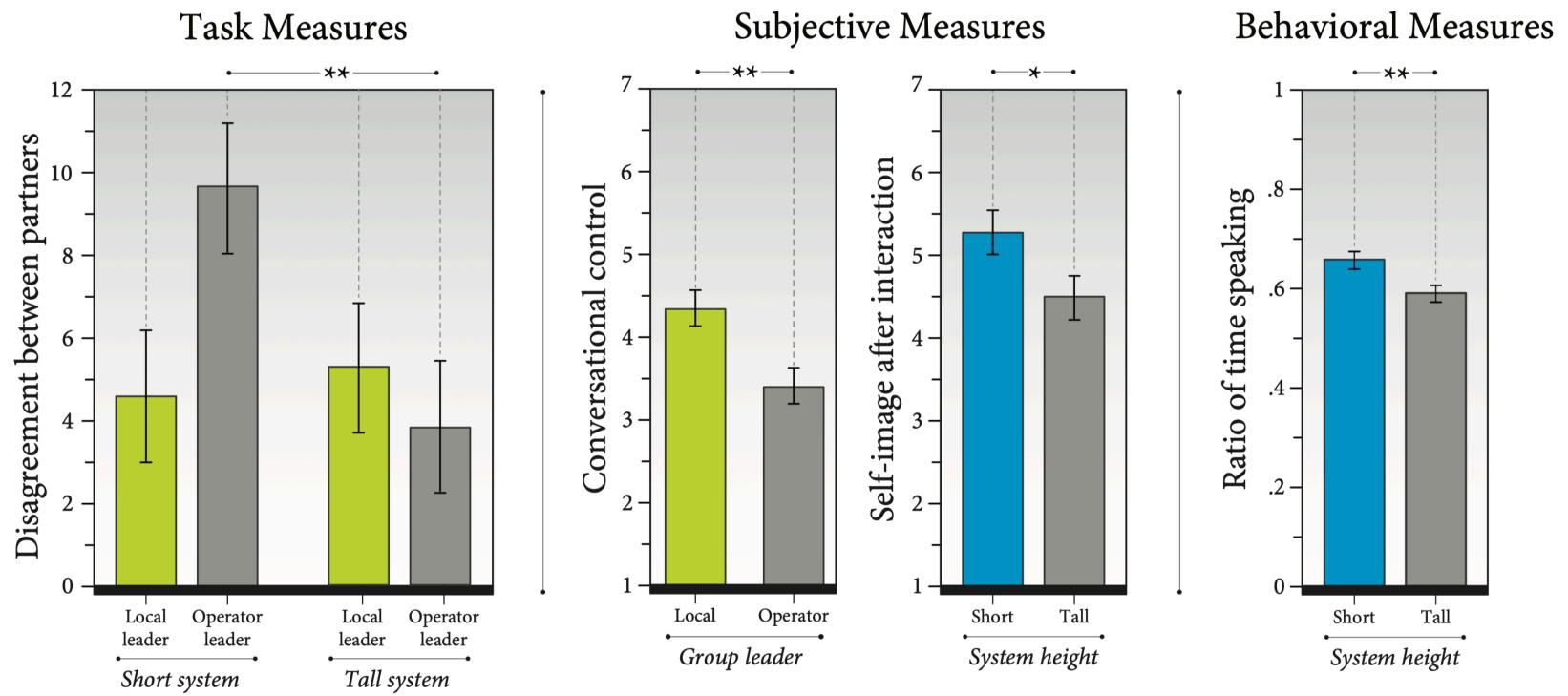
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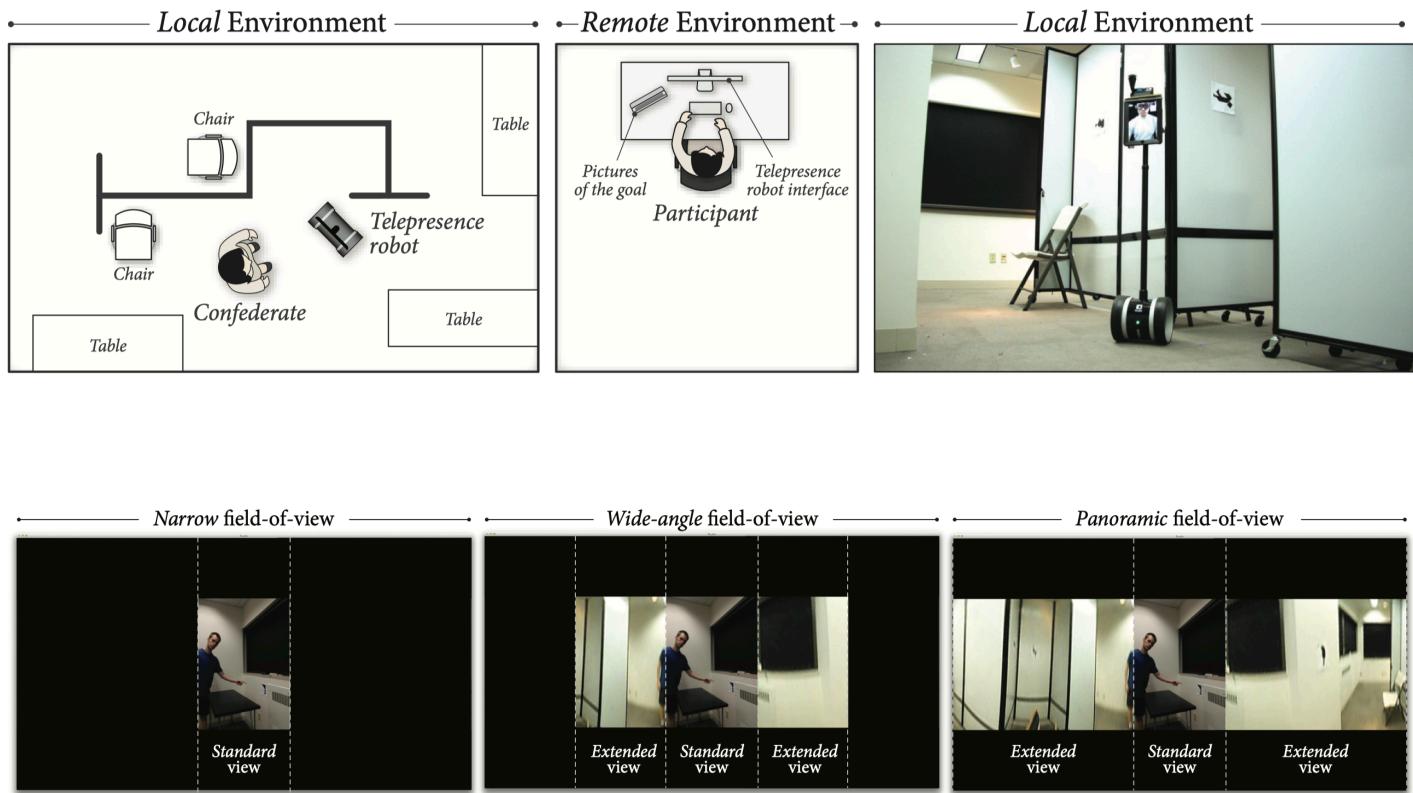
<sup>4</sup>Johnson, Gibson, & Mutlu, 2015, Handheld or handsfree? Remote collaboration via lightweight head-mounted displays and handheld devices

<sup>5</sup>Rae, Takayama, & Mutlu, 2013, The influence of height in robot-mediated communication

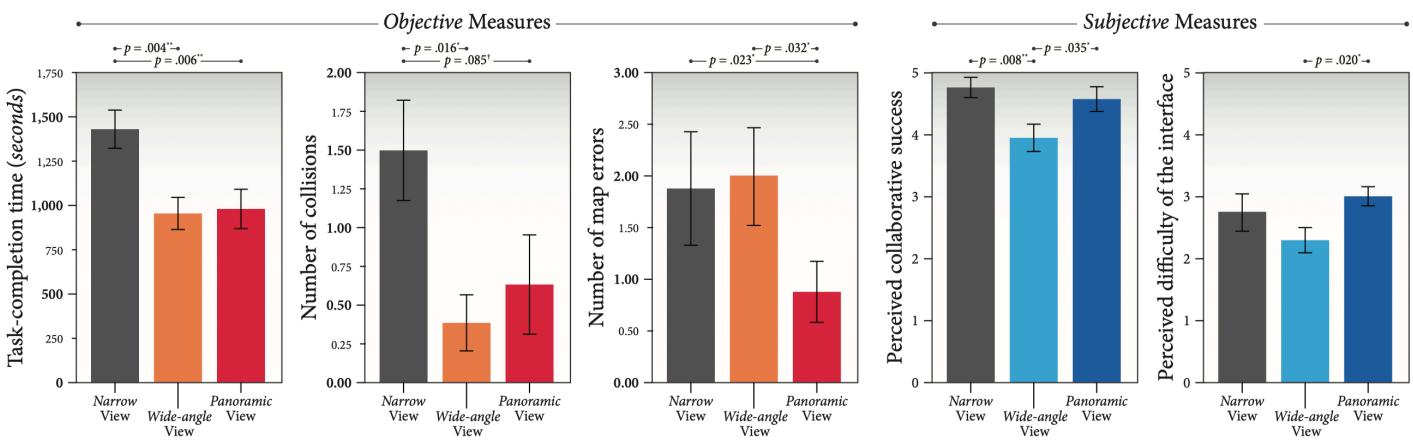
<sup>6</sup>Johnson, Rae, Mutlu, & Takayama, 2015, Can you see me now? how field of view affects collaboration in robotic telepresence.







Prior result	Comparison	Explanation
Keyhole effect	<i>Supported</i>	Increased collisions, slower completion times in narrow view
Cognitive tunneling	<i>Supported</i>	Errors in distance/depth judgments increased collisions in narrow view
Wide views increasing cognitive workload	<i>Supported</i>	Perceived interface difficulty increased in panoramic condition
Wide views distort velocity perception, reducing driving speed	<i>Unsupported, Contrasting</i>	Wide-angle and panoramic views support faster task completion than narrow views
Wider views associated with motion sickness	<i>Unsupported</i>	No participants commented on feeling motion sickness
Impoverished video inhibits mental map formation	<i>Unsupported, Contrasting</i>	Low-quality periphery improved mental map formation over wide-angle and narrow views



# Discussion Questions

- » What other forms of CMC have you used that are not discussed in the readings?
- » In your use of CMC technologies, what are examples of these theories holding or not holding?
- » What external resources have you found that supported/challenged these theories?
- » How do you think we could use these theories?
- » ...