

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>

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

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

<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 that 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

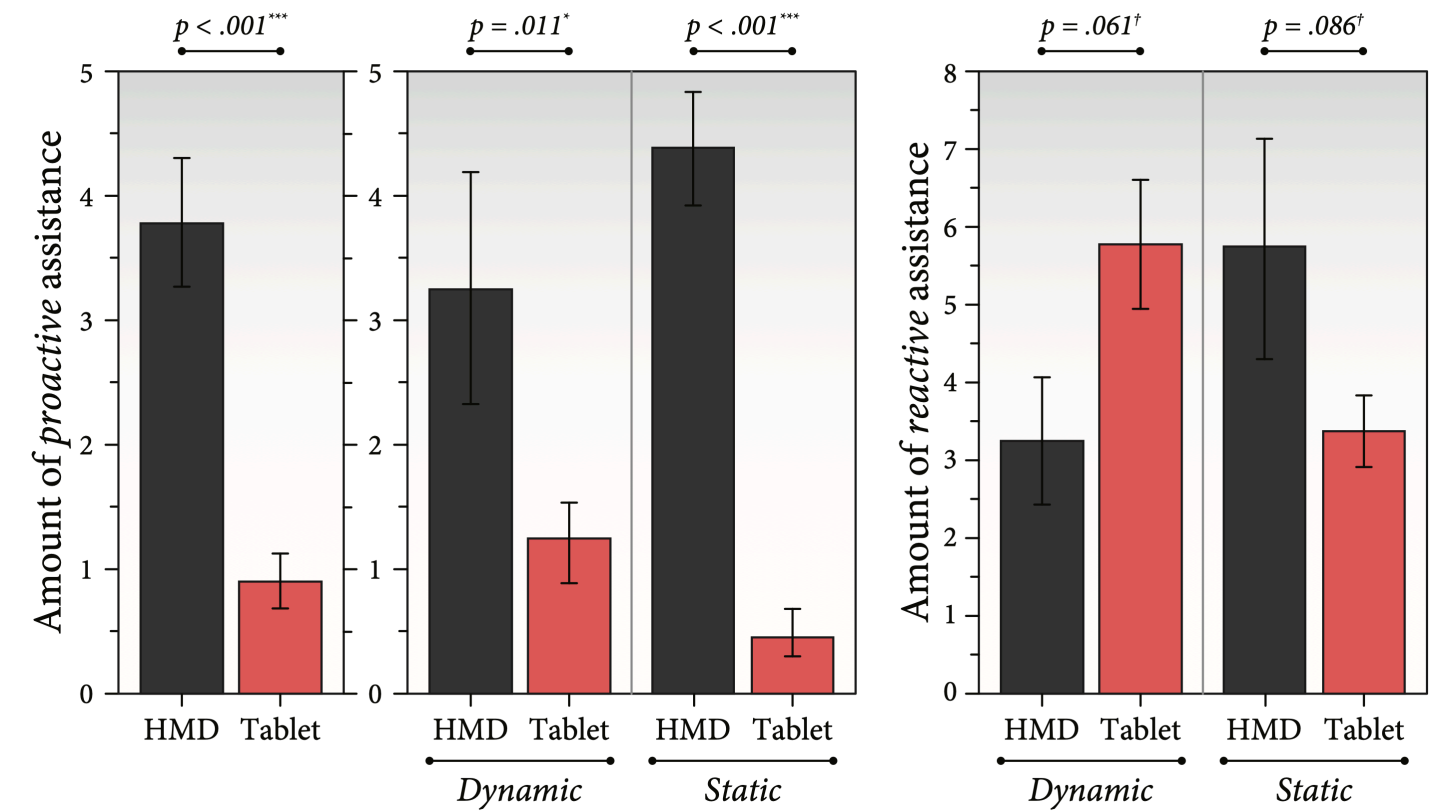
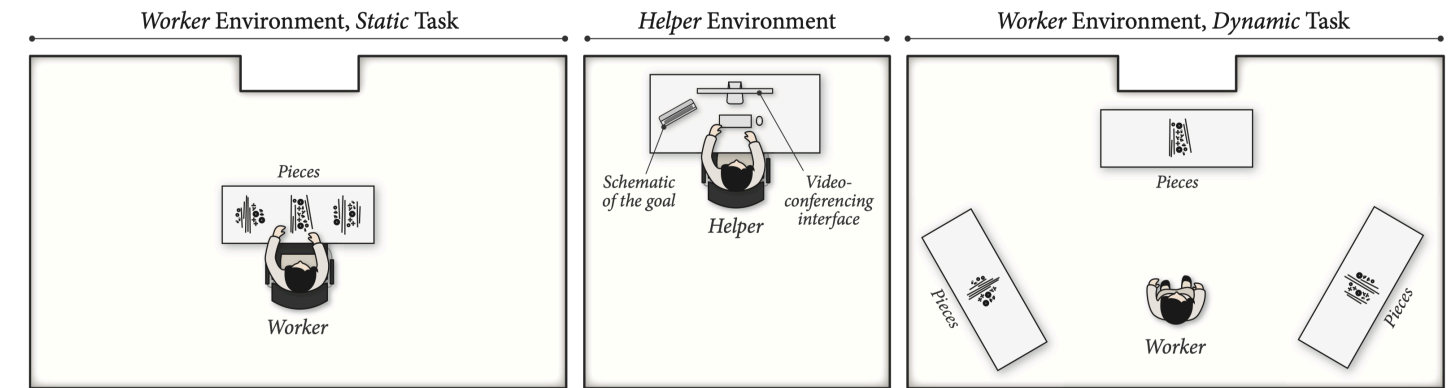
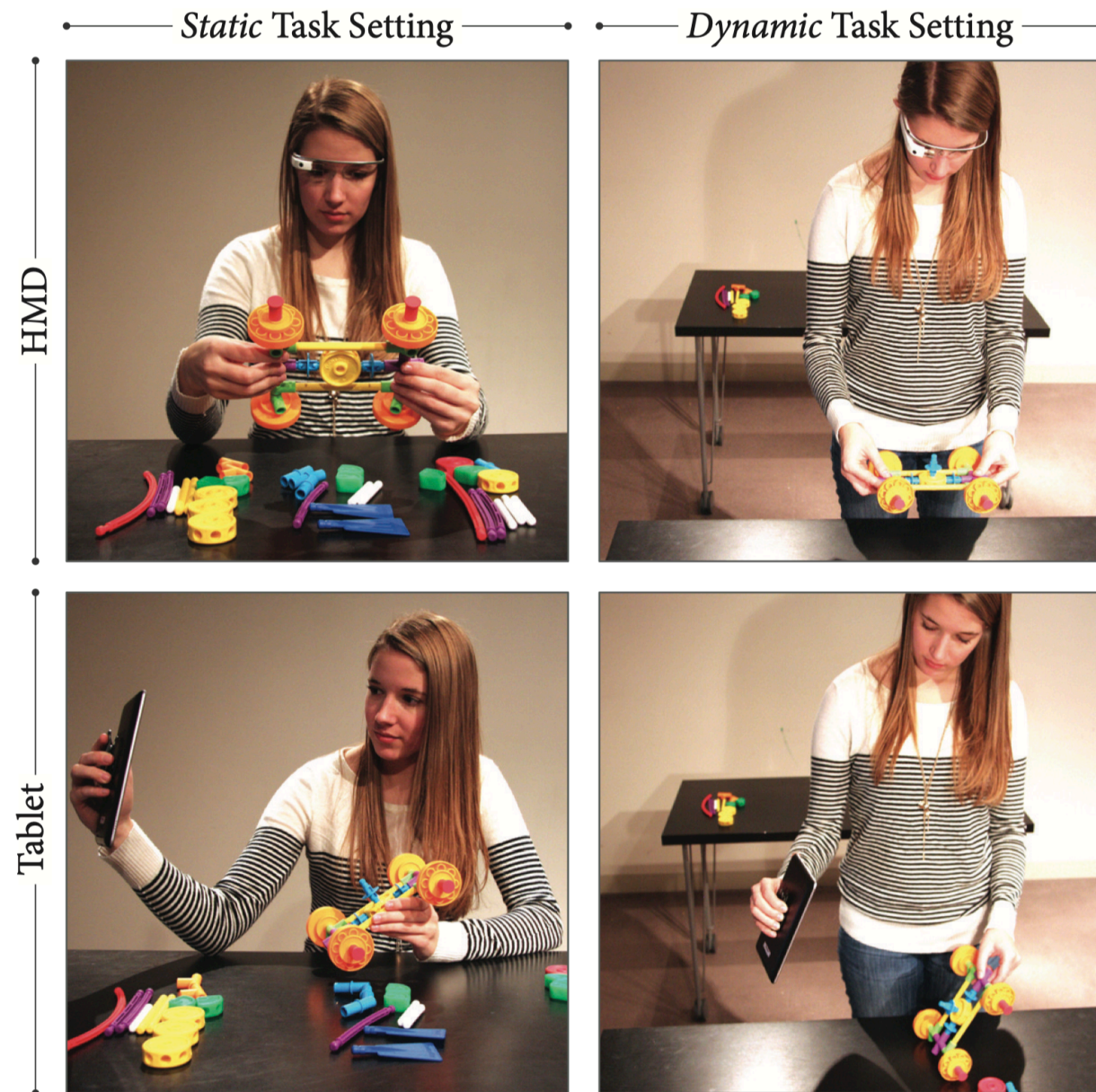
# *What are some newer forms of CMC?<sup>456</sup>*

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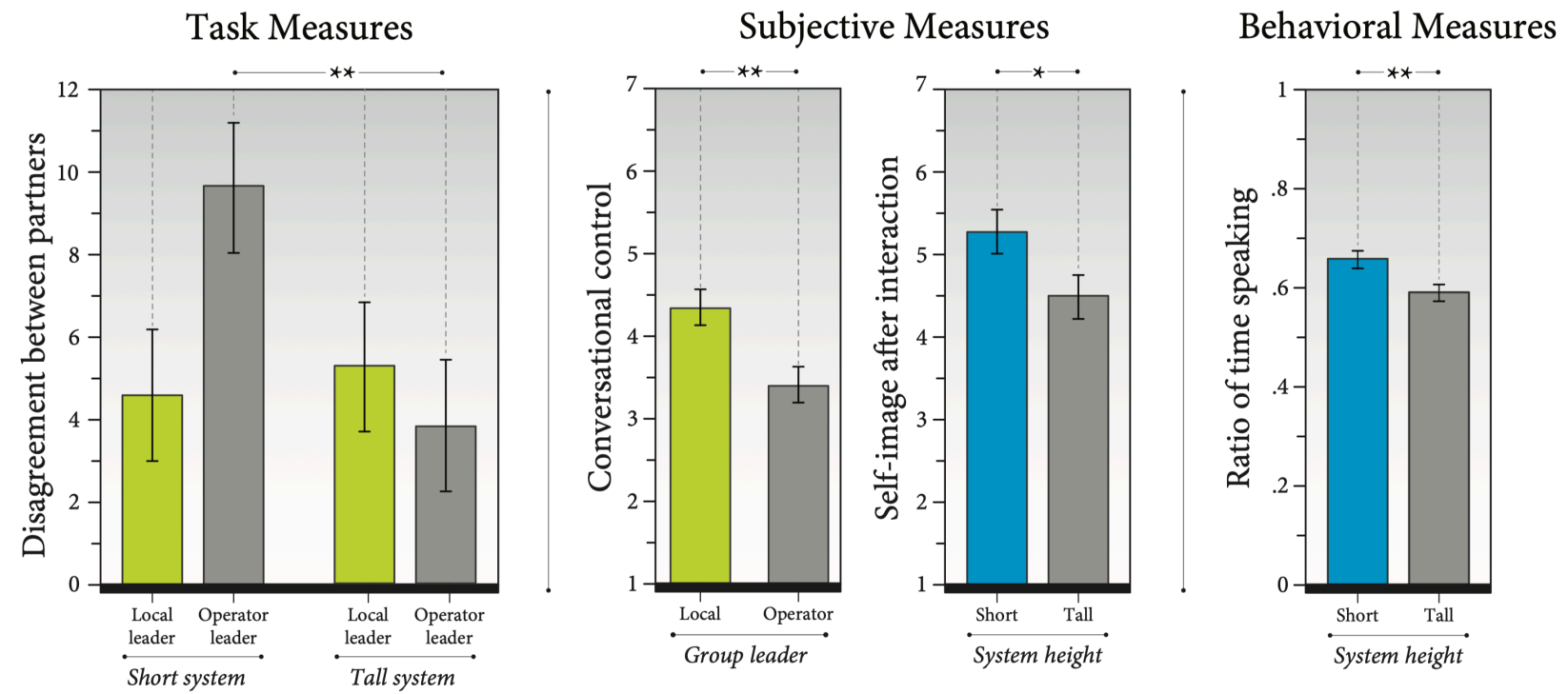
<sup>4</sup>Johnson, Gibson, & Mutlu, 2015, Handheld or handsfree? Remote collaboration via lightweight head-mounted displays and handheld devices

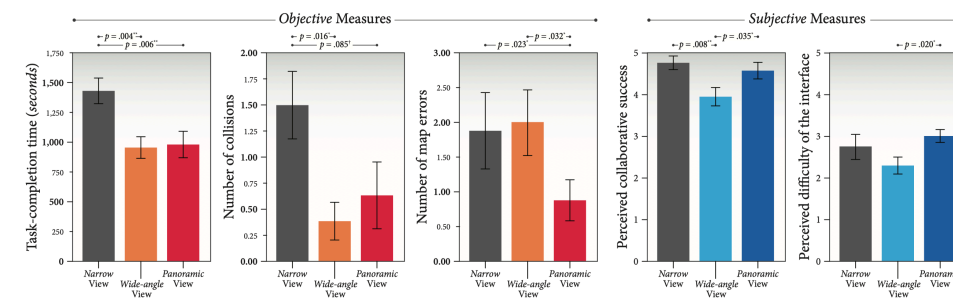
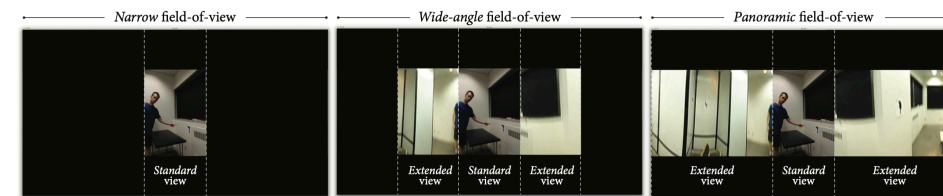
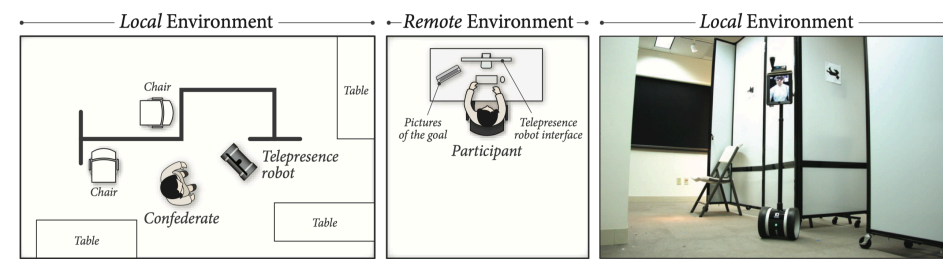
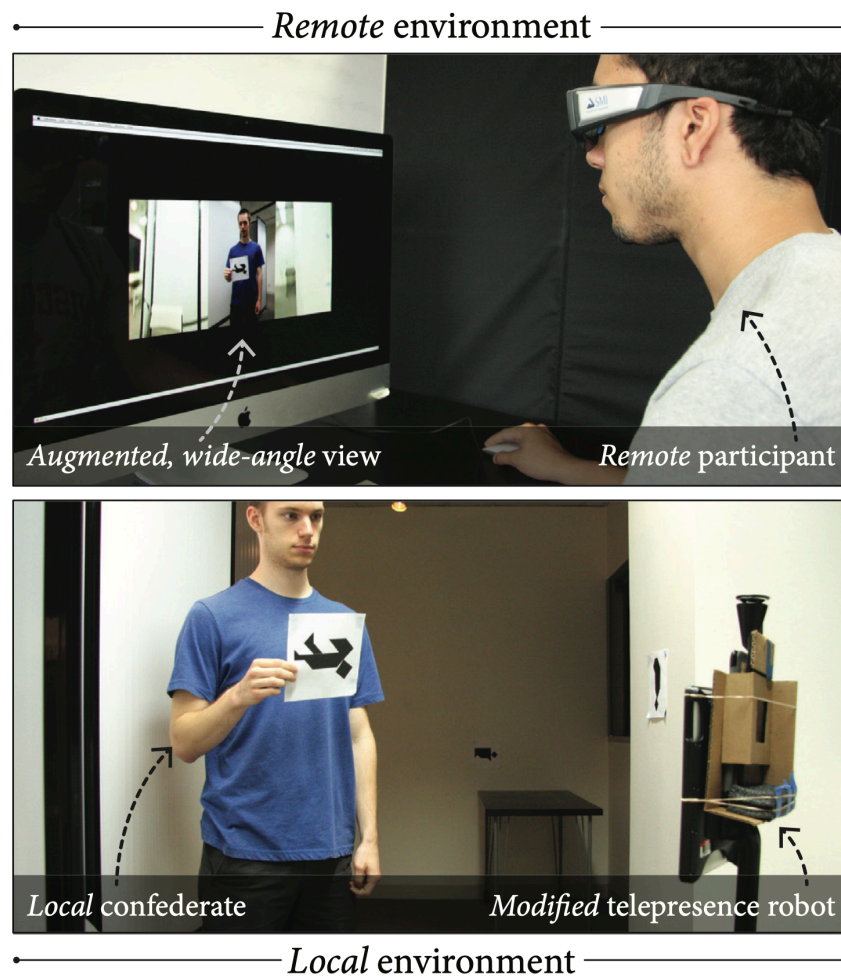
<sup>5</sup>Rae, Takayama, & Mutlu, 2013, The influence of height in robot-mediated communication

<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?
- >> ...