

Intercultural Student Collaboration in Virtual Worlds

Dr. Béatrice S. Hasler

Advanced Virtuality Lab
Sammy Ofer School of Communications
Interdisciplinary Center Herzliya, Israel

Research Project

Funded by the Swiss National
Science Foundation and the
European Union (FP7 Marie Curie)

Field Study: The ShanghAI Lectures

Global Virtual Lectures

Multi-point video-conference

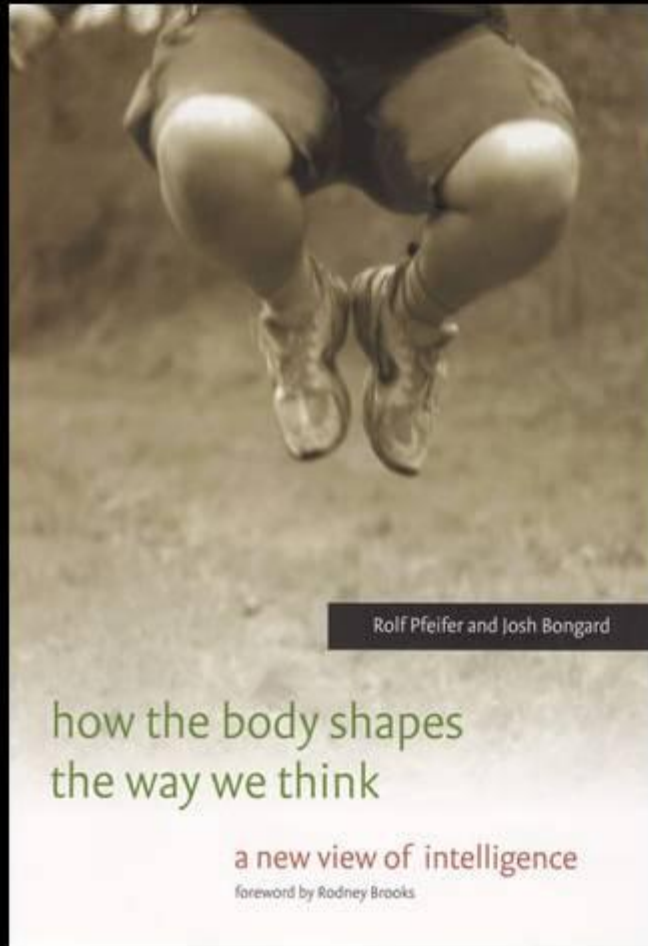


International Student Collaboration 3D CVE (UNIworld)



<http://shanghailectures.org>

Topic of the ShanghAI Lectures



An Introduction to Embodied – Natural and Artificial - Intelligence

Pfeifer, R., & Bongard, J. C. (2006). How the body shapes the way we think. A new view of intelligence. Cambridge, MA: MIT Press.



Participants

More than **100 people** from all over the world contributed to the project!
282 students from **18 universities** world-wide participated in the lectures.



UNIworld: 3D CVE for Student Collaboration



Design by Henn Architekten (Munich) and Studio B (Berlin)

282 students (67 international teams)
18 servers with 5 virtual team rooms each

UNIworld: 3D CVE for Student Collaboration



Open Wonderland: <http://openwonderland.org>

UNIworld: 3D CVE for Student Collaboration



UNIworld: 3D CVE for Student Collaboration



Data Collection

Performance measures

Grading of group exercises

Subjective reports

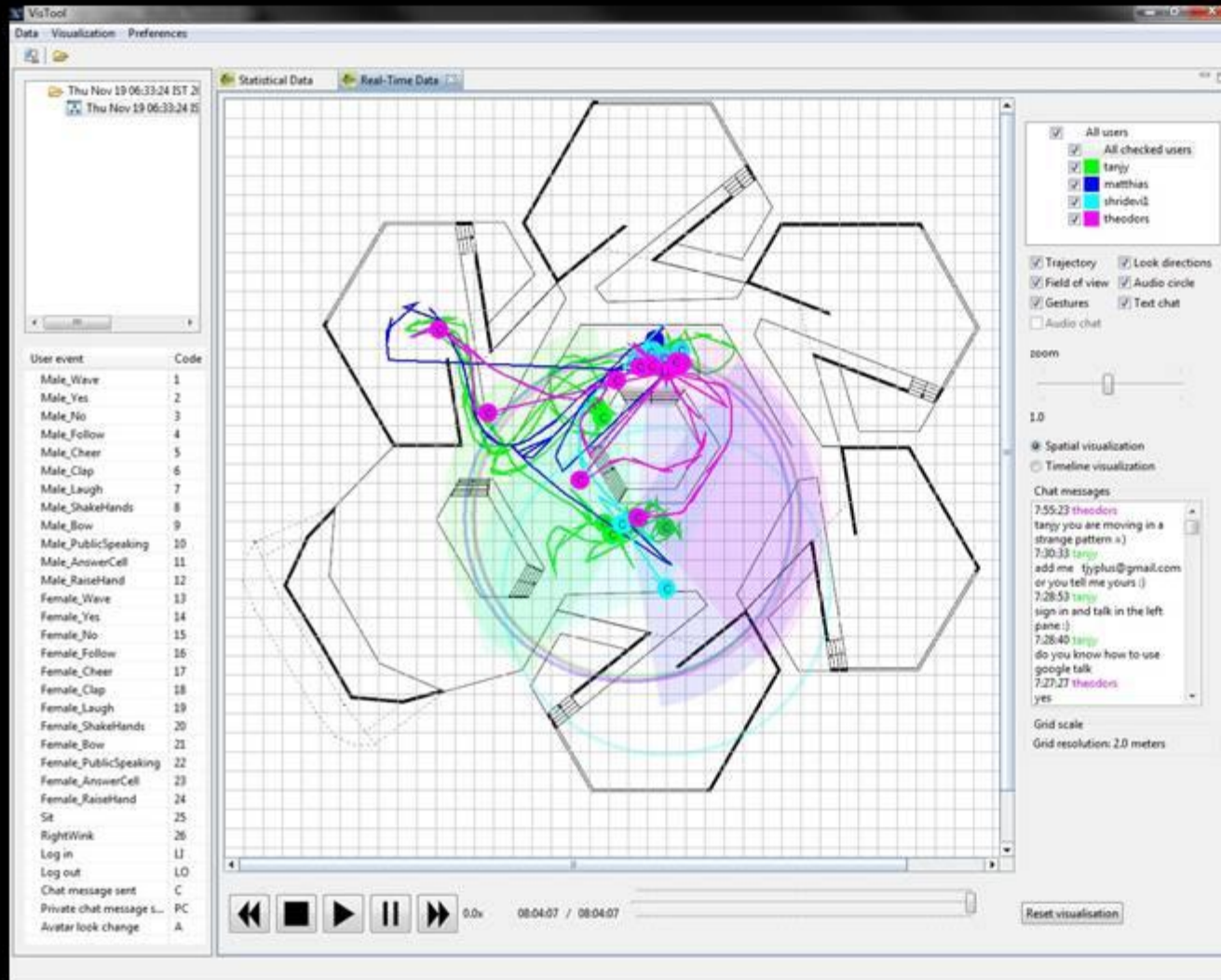
Online questionnaires

Behavioral observation

Automatic tracking of in-world behavior

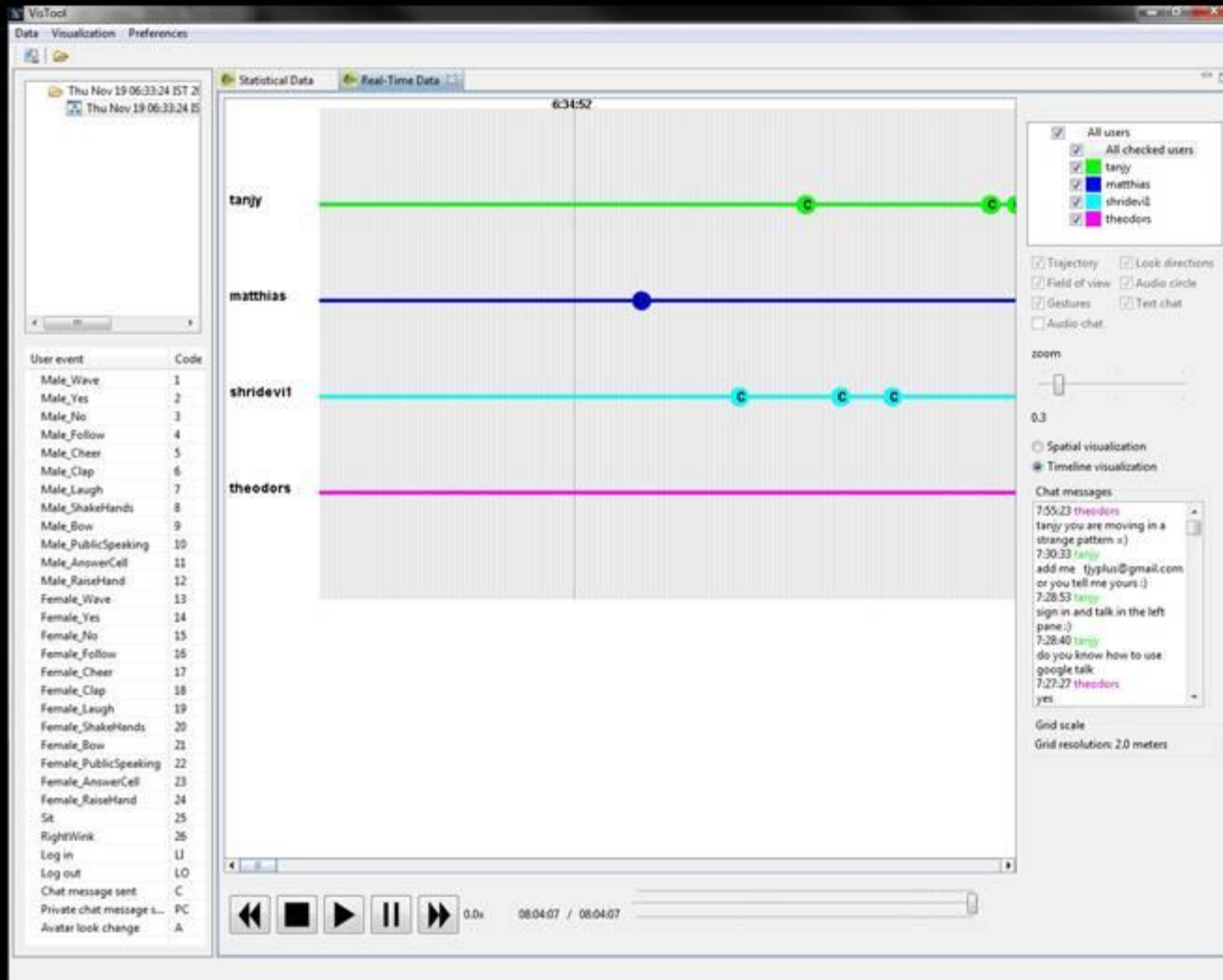
- session info
- navigation (positions, orientation)
- communication
- avatar appearance

Visualization of Behavioral Tracking Data



Spatial
visualization

Visualization of Behavioral Tracking Data



Time-line
visualization

Research Findings

Individual differences in 3D CVE use:

- Effects of culture, gender, and virtual world experience

Dyad interactions:

- Similarities in spatial behavior (interpersonal distance) between the virtual and physical world?

Virtual teams:

- Why do some teams use 3D CVE and others don't?
- 2D vs. 3D virtual teams: Differences in performance, work satisfaction and leadership patterns?

Individual Differences in 3D CVE Use

3D CVE use

Log-in frequency:

- European > Asian ($t = 2.2, p = .03$)

Distance traveled:

- European > Asian ($t = 3.1, p = .003$)

Individual Differences in 3D CVE Use

Verbal Communication

Chat messages:

- Men > Women ($t = 1.9, p = .05$)

Audio chat:

- European > Asian ($t = 2.1, p = .04$)

Nonverbal Communication

Emoticons:)-: :D ;-) :-)

- European > Asian ($t = 2.1, p = .04$)

Gestures:

- Inexperienced VW users > Experienced VW users ($t = 2.1, p = .04$)

Individual Differences in 3D CVE Use

Avatar Changes

Changes in appearance:

- Women > Men ($t = 3.0, p = .003$)

Gender switching:

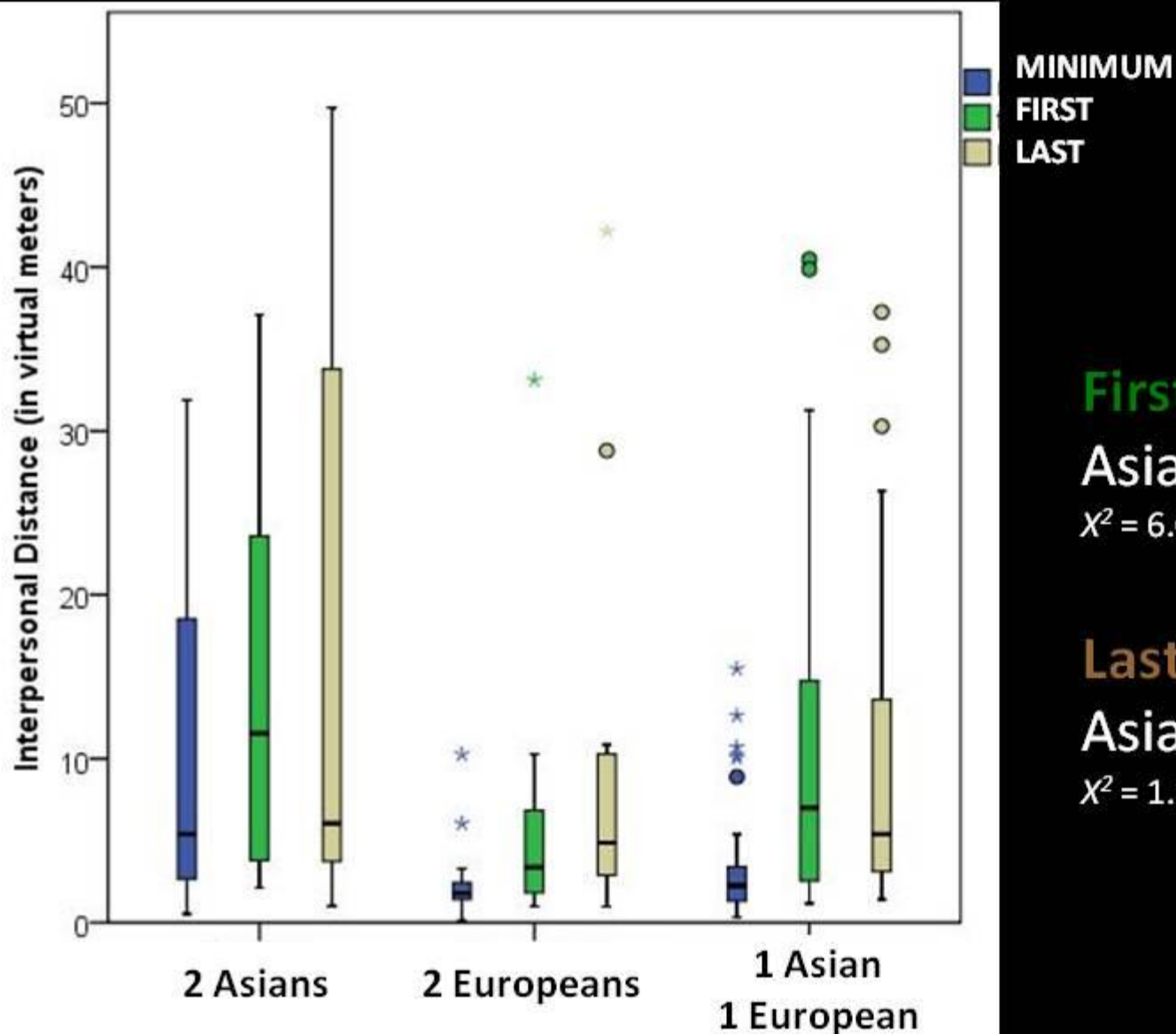
- Women > Men ($t = 2.2, p = .04$)
- Experienced VW users > Inexperienced VW users ($t = 2.0, p = .05$)

Interpersonal Distance (IPD) in Avatar Dyads

Avatars respect each others' personal space. (95% IPD > 1.2vm)



Interpersonal Distance (IPD) in Avatar Dyads



First IPD:

Asian > European

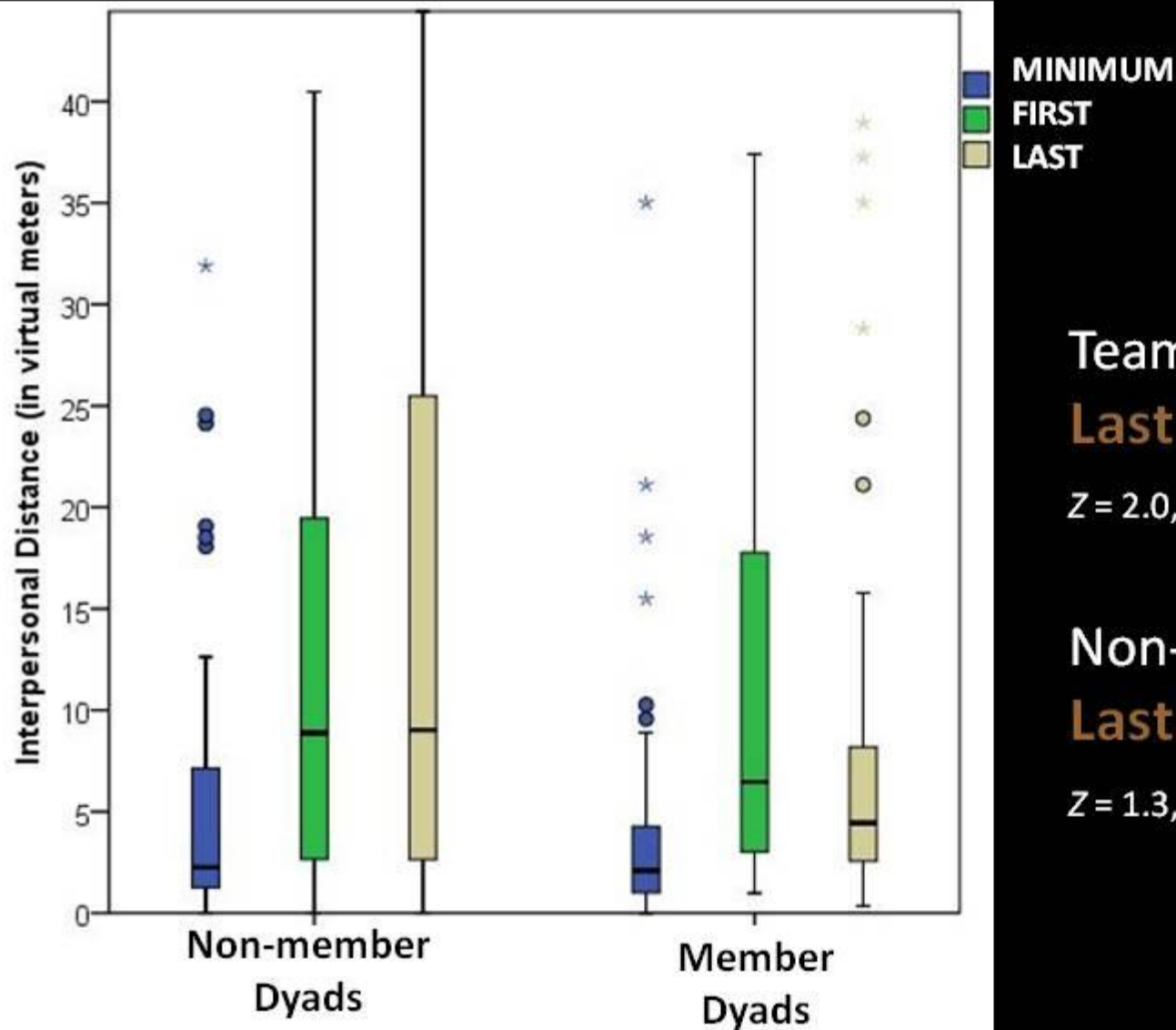
$\chi^2 = 6.0, p = .05$

Last IPD:

Asian = European

$\chi^2 = 1.6, p > .05$

Interpersonal Distance (IPD) in Avatar Dyads



Team members dyads:

Last IPD < First IPD

$Z = 2.0, p = .04$

Non-members dyads:

Last IPD = First IPD

$Z = 1.3, p > .05$

Virtual Teams: Who Uses 3D CVE?

Why do some teams use 3D CVE and others don't?

Differences in group composition:

Age:

- 3D teams > 2D teams ($t = 2.2, p = .03$)

Gender:

- Mixed-gender: 3D teams > 2D teams ($\chi^2 = 3.7, p = .06$)

Culture :

- Mixed-culture: 3D teams > 2D teams ($\chi^2 = 7.3, p = .01$)

3D vs. 2D Teams: Performance & Satisfaction

Performance (quality of outcome):

- 3D teams > 2D teams ($t = 2.0, p = .06$)

Satisfaction (satisfaction with outcome):

- 3D teams = 2D teams ($t = 1.3, p > .05$)

3D vs. 2D Teams: Leadership

Shared Leadership:

- 2D teams (51%) = 3D teams (63%)

Impact on Quality of Outcome:

- 2D: more leaders *increase* performance ($r = .54, p = .01$)
- 3D: more leaders *not correlated* with performance ($r = -.14, p > .05$)

Impact on Outcome Satisfaction:

- 2D: more leaders *increase* satisfaction ($r = .54, p = .01$)
- 3D: number of leaders *not correlated* with satisfaction ($r = -.08, p > .05$)

3D vs. 2D Teams: Leadership

Leadership Strength:

- 2D teams ($M = .77, SD = .30$) = 3D teams ($M = .84, SD = .20$)

Impact on Quality of Outcome:

- 2D: leadership strength *not correlated* with performance ($r = .26, p > .05$)
- 3D: strong leadership *decreases* performance ($r = -.41, p = .03$)

Impact on Outcome Satisfaction:

- 2D: strong leadership *increases* satisfaction ($r = .64, p = .002$)
- 3D: leadership strength *not correlated* with satisfaction ($r = .13, p > .05$)

Outlook: ShanghAI Lectures 2010

We will do it again...

Next lecture series start on September 30th 2010 with more than 20 participating universities from all over the world.

Outlook: ShanghAI Lectures 2010

...but differently!

- Optimized model of the 3D CVE (more space)
- 2 servers instead of 18
- More interactive 3D tasks
- Less video-conference lectures (bi-weekly)
- New: International discussion sessions in UNIworld
- Team building: Time zone considerations!
- Participation in the research project mandatory
- New research agenda

Thank you for your attention!

For more information on the ShanghAI Lectures project: <http://shanghailectures.org>

Or contact me by email: hbeatrice@idc.ac.il