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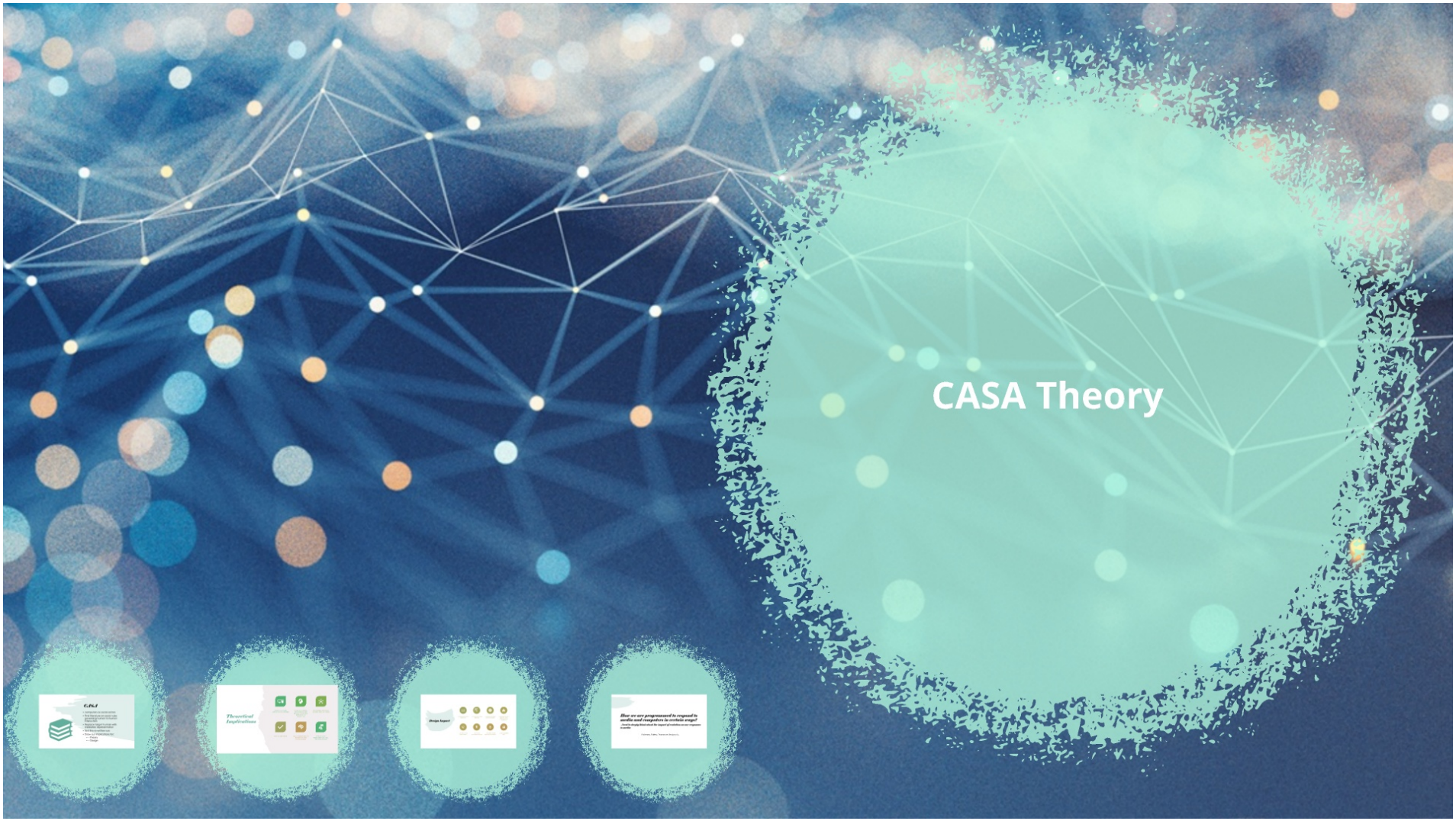
CASA Theory


CASA
• computers as social actors
• Find literature on social rules governing human to human interaction
• Replace target human with mediated representation
• Test the re-written rule
• Draw out implications for:
• – Theory
• – Design


Theoretical Implications
SOCIAL RULES ARE APPLIED TO COMPUTERS!
FINDINGS IN SOCIAL PSYCHOLOGY ARE RELEVANT TO HUMAN RESPONSES TO COMPUTERS
COMPUTERS ARE SOCIAL ACTORS, NOT JUST TOOLS
EASY TO GENERATE
SOCIAL RESPONSES ARE AUTOMATIC AND UNCONSCIOUS
INTROSPECTIVE RESPONSES DON'T TELL THE WHOLE STORY


Design Impact
– MICROSOFT OFFICE ASSISTANTS
– CHARLES SCHWAB WEB SITE
– HEWLETT-PACKARD OSCILLOSCOPES
– GENERAL MAGIC'S PORTICO AND MYTALK VIRTUAL ASSISTANT
– US WEST VOICE MAIL SYSTEM
– BUY.COM CUSTOMER SUPPORT
– JAPANESE AIRLINE RESERVATION SYSTEM
– TALKING BARNEY DOLL


How we are programmed to respond to media and computers in certain ways?
Need to deeply think about the impact of evolution on our responses to media
Politeness, Flattery, Teammate, Reciprocity,


Social rule in mediated presentation
Computer as Social Actor
Nass & Lee
Politeness
Flattery
CASA Theory
Another research done by Nass & Moon
Teammate
Reciprocity


Politeness


Politeness


An example social rule
Q: How do you like the class so far?
A: It's great!
Q: (How do you like the class so far?)
A: Well, some of it good; some bad.
Could this also work with computers?


Experiment on…
1
A computer teaches people one at a time & test
2
Then the computer asks how it performed as a teacher
3
Or a different computer asks the same questions


The Results
• Responses to same computer were more positive:
• "A better computer"
• "I liked the interaction more"
• "I did better on the test"
• "The machine was more technically sophisticated"


Implication
• Social rules are applied to computers!
• Computers are social actors not just tools
• Easy to generate
• Social responses are automatic and unconscious
• Introspective responses will not tell the whole story
• Findings in social psychology are relevant to human responses to computers


Design Implication
• Questions about a product should not be asked by the product
• Technologies should follow politeness rules:
• Quality - tell the truth
• Quantity - say just enough
• Relevance - on the topic
• Clarity - better than precision


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Flattery

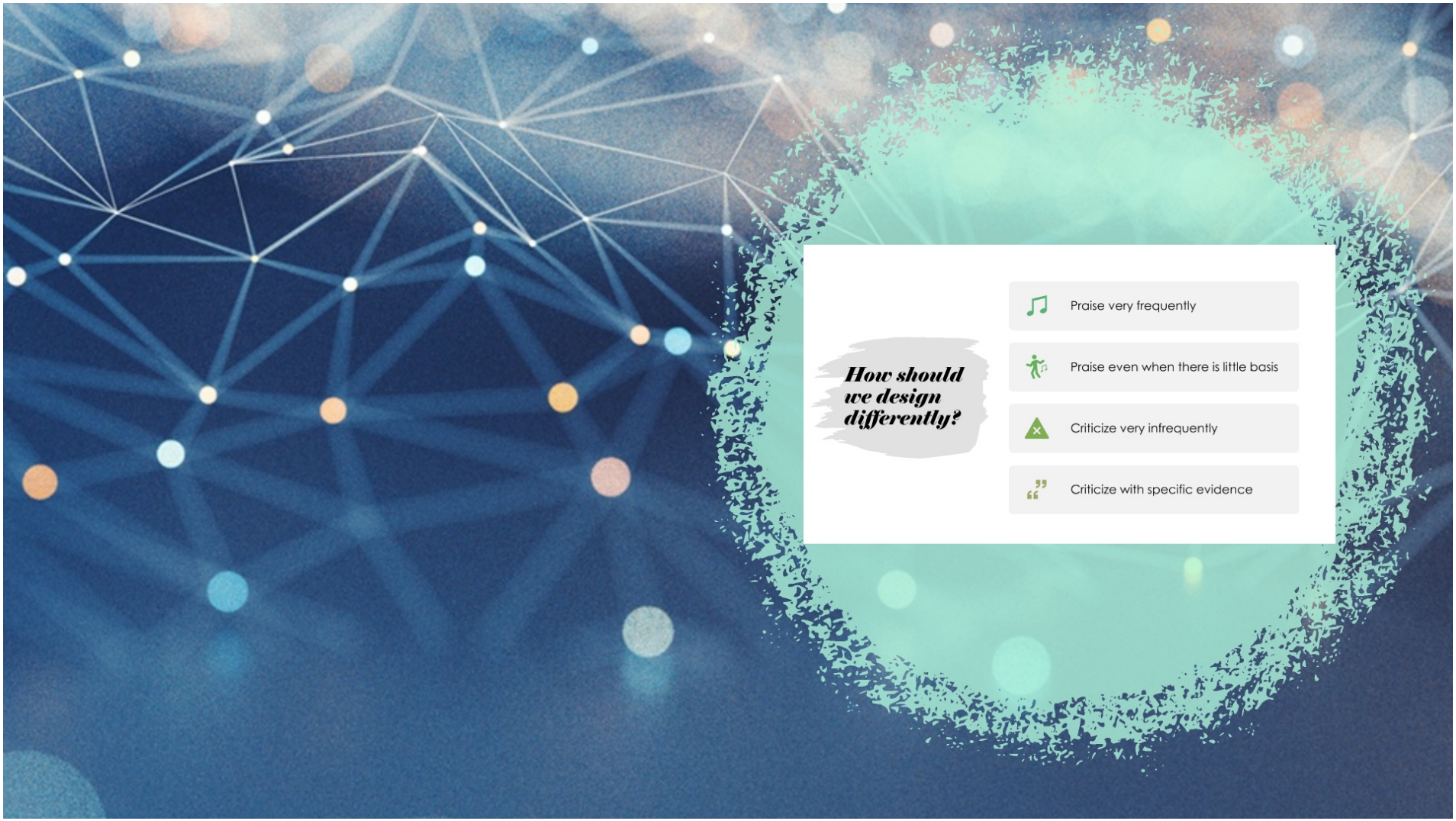

Flattery


An example of social rule for Flattery
Person A: You look great!
Person B: But I just heard you say that to everyone else!
Barney: You did very well! I love you
My daughter: Thanks Barney. I love you too!


The thoughts of person B
Conscious thoughts about the flatterer
Unconscious (and more important) thoughts
I don't believe a thing he says
I don't like flatterers
Maybe I do look great
Person A is insightful and nice


The social rules for flattery
People are suckers for flattery
• Flattery is as good as sincere praise
• Flatterers are as smart as people who praise sincerely
People are not suckers for unwarranted criticism
• Unwarranted criticism does not influence perceptions of self
• All critics are disliked


Experiment..
An experiment:
Performed a task with the computer
Random or non-random evaluation
Praise or criticism (or non-evaluation)
What we measured
Feelings about own performance
Feelings about the computer


How should we design differently?
Praise very frequently
Praise even when there is little basis
Criticize very infrequently
Criticize with specific evidence


Nass & Lee
Politeness
Flattery
CASA Theory
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Teammate
Reciprocity
Social rule in mediated presentation
Computer as Social Actor


Teammate


Teammate

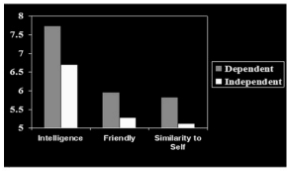

Teammate-Findings
Teammates are perceived as: smarter – friendly – more similar to self
People react to teammates with: more cooperation – more open to influence – greater conformity


Teammate - Variables
• Independent variables
• Teammate or independent computer
• Identity • Dependence
• Dependent variables
• Perception of computer • Behavioral conformity


Teammate - Method
Desert survival task
– discussion – ranking of items
– questionnaire
Text-based

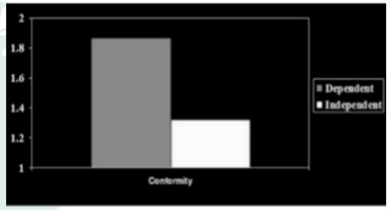
Teammate - Results

PERCEPTION OF COMPUTER



Teammate - Results

- Behavioral conformity




What does this tell us about intelligence?
Affective ties lead to increased perceived intelligence
Wishful thinking increases perceived intelligence


Theoretical implications
"TEAMMATE" IS A FUNDAMENTAL SOCIAL CATEGORY
CREATING A BOND BETWEEN THE USER AND THE COMPUTER IS EASY
DEPENDENCE IS MORE IMPORTANT THAN IDENTITY (OTHER RESEARCH)
INTROSPECTIVE RESPONSES DON'T TELL THE WHOLE STORY


Designing for intelligence
Remind users of dependence
User and software should be peers
Products and services could be marketed as teammates
Perceived performance is very important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Reciprocity


Reciprocity


Reciprocity


Reciprocity-
Social Rule
IF SOMEONE
HELPS YOU, YOU
WILL HELP THEM


Reciprocity – An Expeirment
• Desert survival task
• A computer asks for help on color ranking task
• Same computer
• Different computer

Reciprocity experiment


Reciprocity - Theoretical Implications
Computers Are Social Actors predicts behaviors as well as attitudes
Computers can elicit moral obligations
Computers can elicit revenge
Unhelpful performance leads to unhelpful behaviors


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Nass & Lee

Nass & Lee

- Computer-Synthesized Speech Manifest Personality?
- Recognition, Similarity attraction and Consistency attraction

Does Computer-Synthesized Speech Manifest Personality? Experimental Tests of Recognition, Similarity–Attraction, and Consistency–Attraction

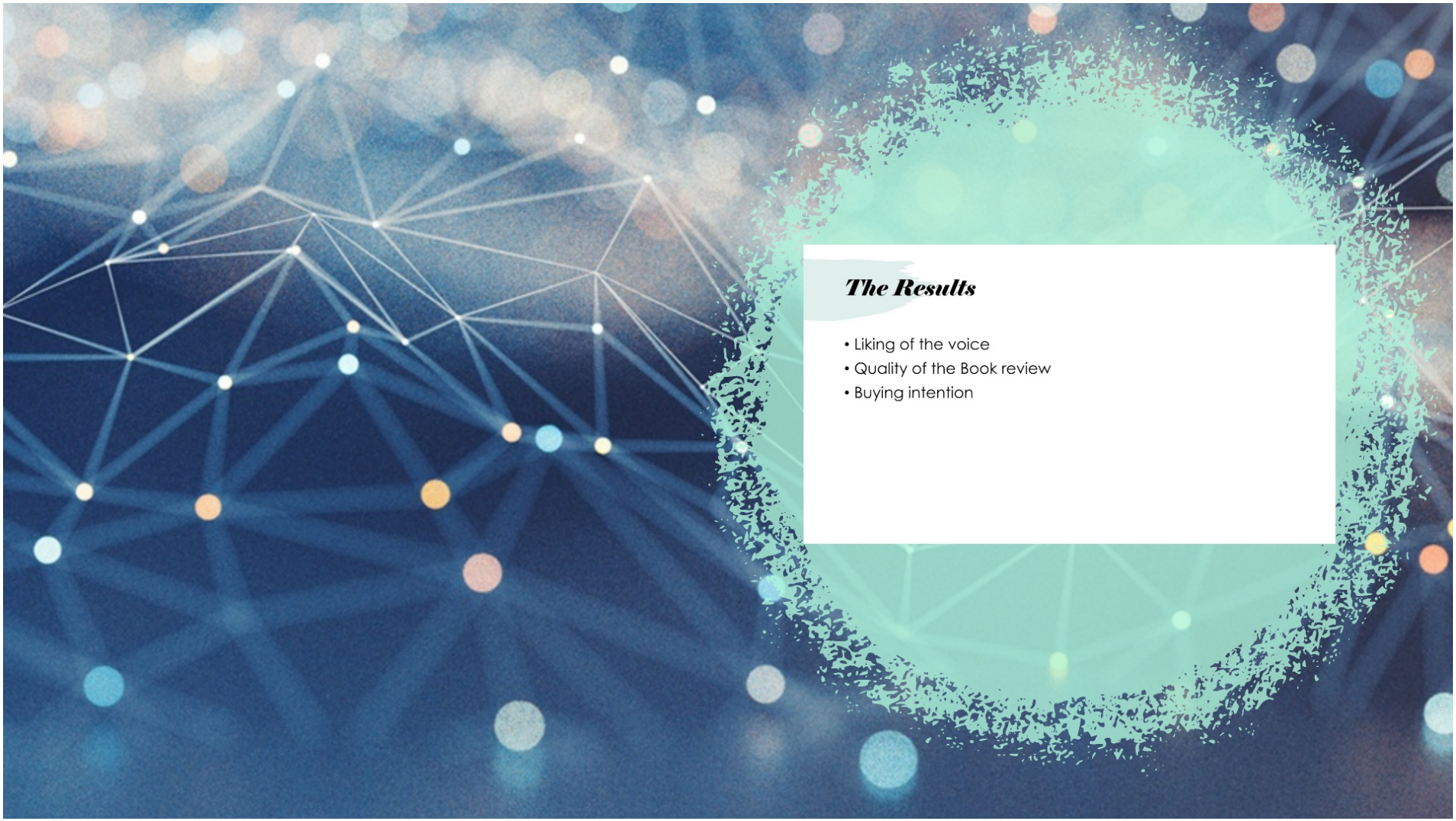
Clifford Nass and Kwan Min Lee
Stanford University


Personality markers in speech
• Extroversion vs. Introversion
• Two types of personality cues:
• Linguistic cues
• Extroverts: stronger words, higher confidence, more adjectives, verbose
• Paralinguistic cues
• Extroverts: faster, louder, higher F0, wider pitch range
• 2 experiments


EXI: Similarity Attraction Experiment
• 2X2 balanced, between-participants design
• IV1: Personality of participants
• IV2: Personality of synthetic speech
• Myers-Briggs personality scale – Wiggins Introvert adjective index – Wiggins Extrovert adjective index
• 72 participants


Voice Personality
• Extrovert voice: 140Hz (F0) /40Hz (Pitch Range) /216 words/min (Speech Rate)/100% (Volume level)
• Introvert voice: 84Hz (F0) / 16Hz (Pitch Range) / 184 words/min (Speech Rate) /15% of original volume level


Predicted Effects of Voice Personality
• Personality attribution : Voice
• Personality inference : Reviewer (virtual speaker)
• Effects of match : Liking of the voice • Quality of the review • Buying intention


The Results
• Liking of the voice
• Quality of the Book review
• Buying intention


For the measures that were asked for each book, we used a full-factorial repeated measure analysis of variance (ANOVA) with book as the repeated factor and computer voice personality and participant personality as the between-subjects factors. For the items that were only asked once, we used a full-factorial 2 × 2 ANOVA. Table 1 reports mean, standard deviations, F values, and effect sizes for all dependent variables. We also conducted a full-factorial repeated measure analysis of covariance (ANCOVA) and a full factorial 2 × 2 ANCOVA with a gender covariate for all hypotheses to check for gender effects. The results were substantively identical in all cases, indicating that the gender of the participant was not an influential factor in participants' responses to TTS voices. Hence, only the ANOVA results are reported here.
Consistent with Hypothesis 1, users applied vocal stereotypes to computer-synthesized voices: The extrovert computer voice was perceived as being much more extroverted (M = 4.86, SD = 1.67) than the introvert computer voice (M = 3.34, SD = 0.91; see Table 1). Neither a main effect of participant personality nor an interaction effect was found.
Consistent with the literature on similarity-attraction and its application to human–computer interaction (Hypothesis 2), there was a large and significant crossover interaction between computer voice personality and participant personality for voice attractiveness, such that introverts preferred the introvert voice and extroverts preferred the extrovert voice. Because attractive communicators are more credible (Eagly & Chaiken, 1975; Mills & Aronson, 1965), there was also a large similarity-attraction effect with respect to voice credibility, as indicated by the significant crossover interaction.
Similarity-attraction extended beyond the voice. There was a moderate interaction indicating similarity attraction with respect to the quality of the book review (Hypothesis 3). Consistent with Hypothesis 4, there was a large and significant crossover interaction with respect to purchase behavior, with participants more likely to buy the book when the voice personality matched their own.
The personality of the voice influenced perceptions of the personality of the reviewer, even though the content of the review was held constant (Hypothesis 5). Specifically, the reviewer was perceived as being clearly more extroverted when the descriptions were narrated by the extrovert computer voice (M = 5.67, SD = 1.38) than by the introvert computer voice (M = 4.45, SD = 1.52). Neither a main effect of participant personality nor an interaction effect was found. Consistent with this result, participants found the reviewer more attractive when the voice personality and participant personality were similar. In addition, participants trusted the reviewer more when the two personalities matched. Both of these effects demonstrate the power of the similarity-attraction principle.
Result EX 1

All analyses were based on a full-factorial 2 × 2 × 2 ANOVA model. Consistent with Experiment 1, users recognized the personality cues in computer-synthesized voice (Hypothesis 1): The extrovert computer voice was perceived as being clearly more extroverted (M = 5.55, SD = 1.88) than the introvert computer voice (M = 4.18, SD = 1.27), $F(1, 72) = 21.41$, $p < .001$, $\eta^2 = .23$.[5] Similarly, the manipulation of text personality was successful: Extrovert text clearly was perceived as being more extroverted (M = 6.37, SD = 1.29) than introvert text (M = 4.56, SD = 1.09), $F(1, 72) = 58.00$, $p < .001$, $\eta^2 = .45$.

There was very strong evidence for consistency-attraction effects. When the voice personality and text personality matched, participants very clearly preferred the voice compared to voice–text mismatch participants (Hypothesis 6; see Tables 2 and 3). Similarly, voice–text match participants liked the text much more than did mismatch participants (Hypothesis 7). Matched participants found the writer to be clearly more credible and tended to like the writer more than mismatch participants. These latter results are particularly striking in that the text, which was a (presumably) direct indication of the writer (in contrast to Experiment 1), clearly manifested the writer personality.

Consistent with Experiment 1, participants inferred the personality of a writer on the basis of the personality of the computer voice they heard (Hypothesis 2): The writer was perceived as being much more extroverted if the writing was narrated by an extrovert voice (M = 6.32, SD = 1.48) as compared with an introvert voice (M = 5.17, SD = 1.57), $F(1, 72) = 24.60$, $p < .001$, $\eta^2 = .26$. Similarly, the computer voice personality influenced the perception of text personality (Hypothesis 8): Text narrated by an extrovert computer voice was perceived as being clearly more extroverted (M = 5.84, SD = 1.41) than text narrated by an introverted computer voice (M = 5.09, SD = 1.44), $F(1, 72) = 5.9$, $p < .01$, $\eta^2 = .12$. This latter result is particularly striking given that the text personality was clearly manifested.[6] It should be noted that the consistency effects were more accentuated for the extrovert text as compared with the introvert text, perhaps as a result of the lengthier content producing a stronger instantiation of the manipulation. (As noted earlier, extending the introvert text to match the length of the extrovert text was problematic because introverts use much fewer words than extroverts.)

Replicating Hypothesis 2, there was a large and significant similarity-attraction effect for voice, with voice–participant matching participants clearly preferring the voice as compared with nonmatching participants.

There was limited evidence for similarity-attraction extending beyond the voice, perhaps because text personality was strongly manifest and a confounding aspect in this experiment. Voice–participant matching participants did like the writer much more than did mismatching participants (Hypothesis 3). There was no significant interaction with respect to credibility of the writer nor for liking of the text, in contrast to Experiment 1.

In contrast to previous research, there was very little evidence of similarity-attraction with respect to the match between participant and text personality, perhaps because the effects were swamped by the voice effects (which in all cases were stronger than the text effects).

In contrast to Experiment 1, there were clear main effects for voice personality and text personality. Participants in the extroverted-voice condition liked the voice (M = 4.18, SD = 1.72), the text (M = 4.59, SD = 1.33), and the writer (M = 4.83, SD = 1.48) much more than did participants in the introverted-voice condition (M = 2.66, SD = 0.96; M = 3.60, SD = 1.48; M = 3.90, SD = 1.24, respectively), perhaps because the dynamism of the extroverted voice made the boring content of arcane auction items more palatable. The richer extrovert text may have similarly enlivened the content, leading to more positive perceptions of the content (M = 4.61, SD = 1.62) and the voice (M = 3.77, SD = 1.94) as compared with the flat introvert text


Synthetic Voice Personality — Implications
• Synthetic voices manifest personality. – Personality attribution in doubly disembodied language • Proximate sources (synthetic voices) influence the imaging of virtual speakers (sources). – Proximate source orientation • People socially respond to manifested synthetic voice personality – Similarity attraction


Voice and Text Consistency — Implications
• – Synthetic voices have personality – Consistency between voice and text personality is important – "Casting" of synthetic voice personality is important – Strong effect of paralinguistic cues in doubly disembodied language
• Proximate source orientation – Neutral text – Personality-rich text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Another
research done by
Nass & Moon


Mindlessness (Langer)
• "Excuse me, may I use the Xerox machine, because I'm late to class?" – request + reason → 94% compliance rate
• "Excuse me, may I use the Xerox machine?" – request + no reason → 60%
• "Excuse me, may I use the Xerox machine, because I have to make some copies?" – request + bogus reason → 93%


Mindlessness behaviors?
• Why?
• Occurs as a result of conscious attention to a subset of contextual cues which trigger various scripts, labels, and expectations
• Rather than carefully processing information based on all relevant features of the situation, individuals responding mindlessly prematurely commit to oversimplistic scripts drawn in the past.
• Why to non-human objects?
• Perceived social actorness as a necessary condition
• To elicit mindless social responses, an object must have enough cues to lead a person to categorize it as worthy of social responses.


Floods of Theory: Questions about human information processing
Mindlessness vs. Mindfulness (Langer)
Peripheral vs. Central (Petty & Cacioppo)
Heuristic vs. Systematic (Chaiken)


Media related questions
• How do technology and media use contribute to mindlessness?
• Media as stereotype generator
• Constant practice of mindlessness
• Are people more mindless than they used to be?

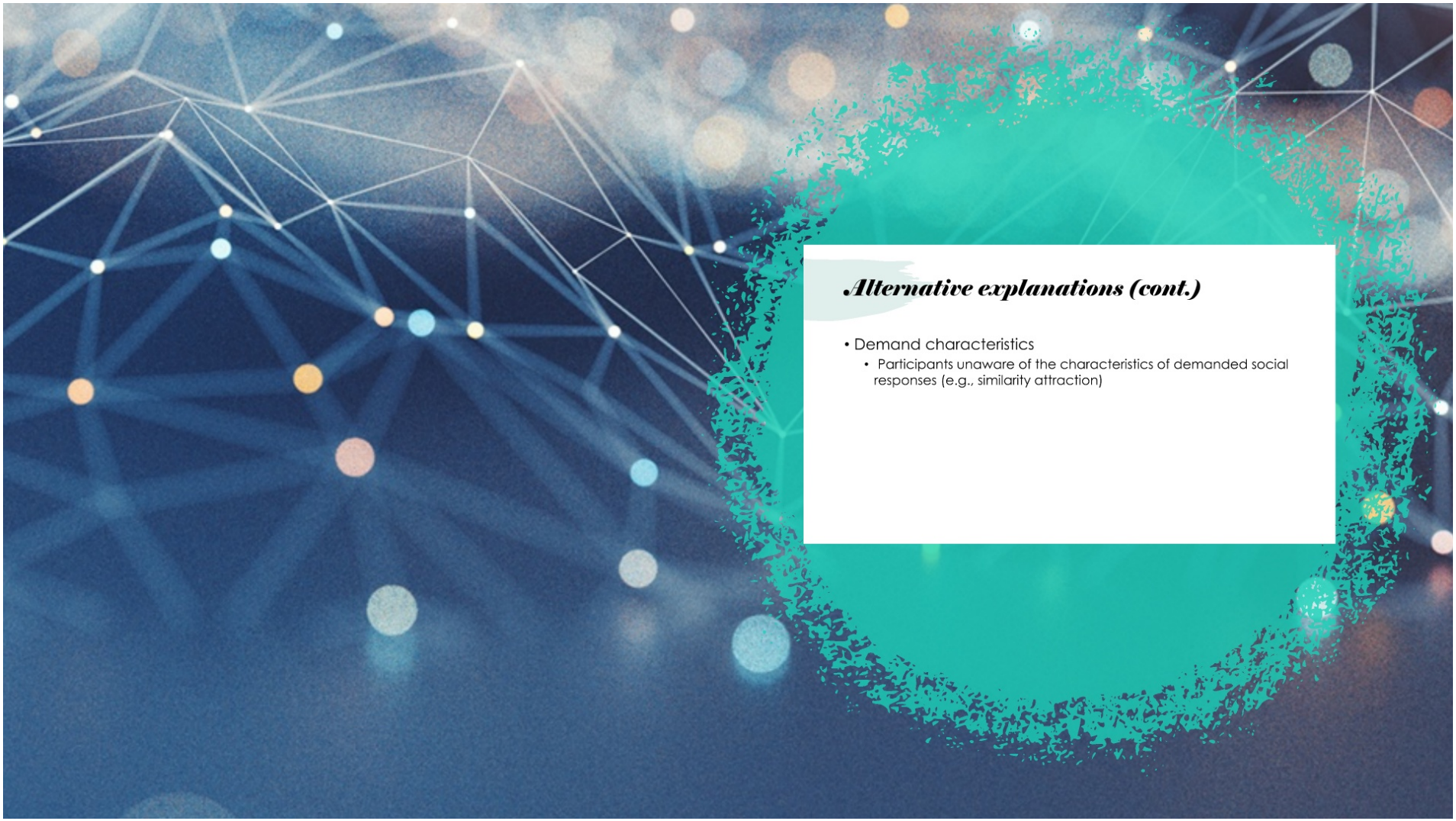

CASA explained by Mindlessness
• Over-use of human social categories
• "Individuals would carry over uniquely human social categories to the computer realm"
• Gender stereotyping
• Ethnicity of computer agents
• In-group vs. out-group


CASA explained by Mindlessness (cont.)
• Application of over-learned social behaviors
• "Mindless social responses arising from deeply ingrained habits and behaviors"
• Use of script
• Politeness
• Reciprocity
• Reciprocal self-disclosure


CASA explained by Mindlessness (cont.)
• Use of premature cognitive commitments
• Judgment based on peripheral cues
• Specialists
• Application of complex social responses
• Not mere identification but the application of complicated social rules
• Personality


Alternative explanations
• Explanations based on mindful responses
• Anthropomorphism
• Individuals erroneously believe that computers are humans (ignorance of ontological nature)
• Adult participants rule out this explanation (?)
• Nass' explanation can be wrong! – Anthropomorphism might be an evolved cognition
• Cf. CASA is based on Etopoeia (direct response to an entity as human while knowing that the entity is not human)
• Emotional attachment
• Individuals are mindful of their emotional attachment to an object
• Individuals in CASA studies were unaware of their behaviors
• No time for developing emotional attachment in experiments


Alternative explanations (cont.)
• Orientation to the programmer (people behind computers)
• No participants indicate that they did not have the programmer or other humans in mind
• Programs in different computers were written by the same computer and participants knew this yet, they respond differently (e.g., politeness)
• Thinking about the programmer is not a default mode (negative feeling in the programmer condition Source orientation)
• Lee & Nass (2004) eliminates this explanation


Alternative explanations (cont.)
• Demand characteristics
• Participants unaware of the characteristics of demanded social responses (e.g., similarity attraction)


CASA explained by Mindreading
• Remember Autism!
• Mindblindness as a falsifying condition for CASA
• See Lee (2005)!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