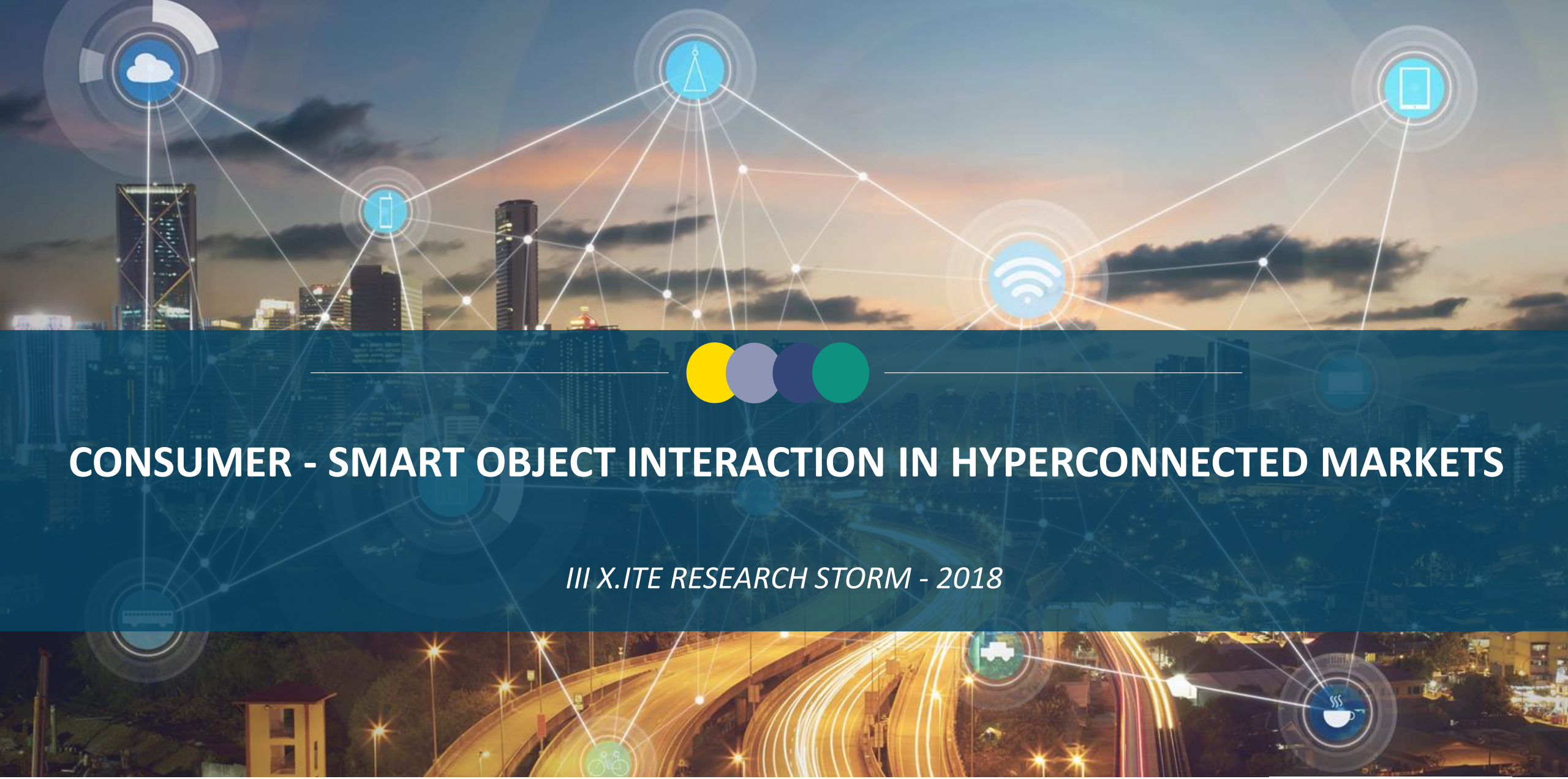


CONSUMER - SMART OBJECT INTERACTION IN HYPERCONNECTED MARKETS

III X.ITE RESEARCH STORM - 2018

LUISS

.ITE INSIGHT TECHNOLOGY ENHANCED

AGENDA

- HYPERCONNECTED MARKETS
- NEW MARKET OPPORTUNITIES AND CONSTRAINTS
- SMART-OBJECTS POLIEDRIC ROLE
- NEW FRONTIERS IN CONSUMERS INTERACTIONS

HYPERCONNECTED MARKETS (1/2)

Exponential growth of connected **objects and devices:**
30 Billions by 2020, up to 1 Trillion by 2030.

The IoT market will be worth **$581B** for ICT-based spend alone, growing at a Compound Annual Growth Rate (CAGR) between 7 and 15% - source McKinsey 2018

Smart Cities (23%), Connected Industry (17%) and Connected Buildings (12%)

The Industrial Internet of Things (IIoT) market is predicted to reach **$123B** in 2021, attaining a CAGR of 7.3% through 2020 - Accenture forecasts IIoT can add as much as **$14.2T** to the global economy by 2030.

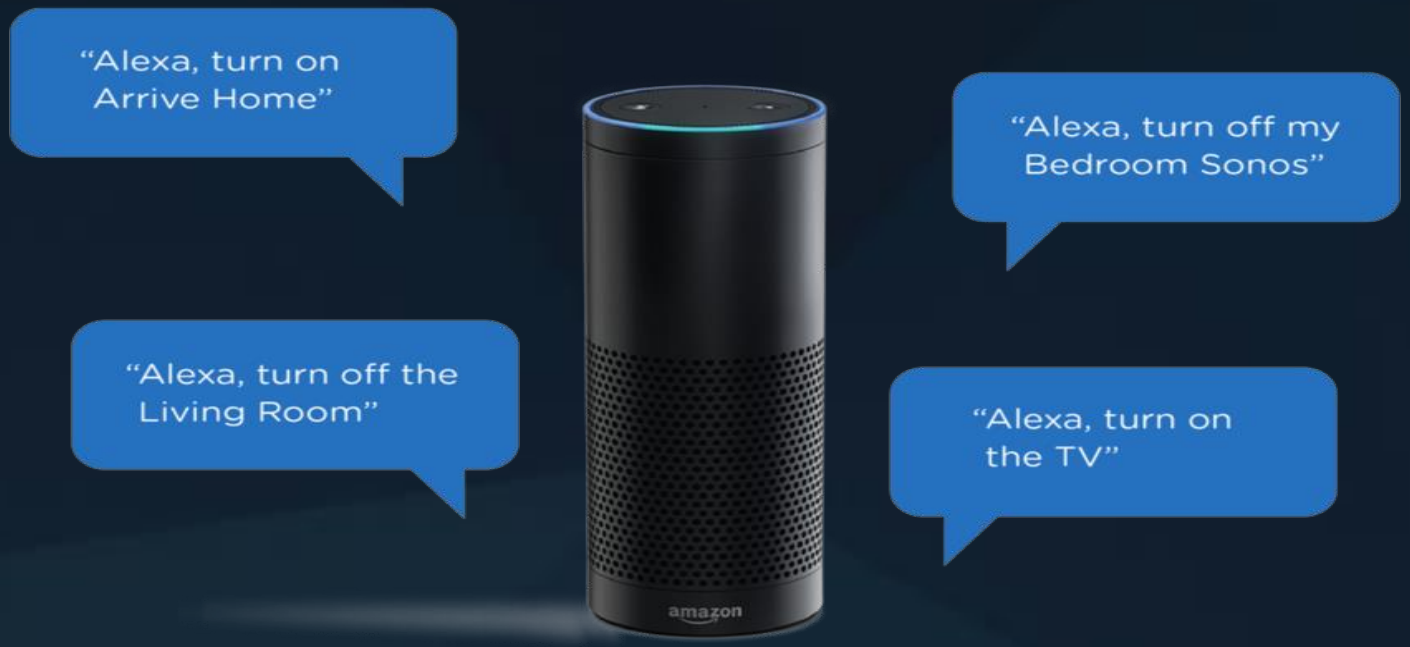
12.86 billion IoT sensors and devices *will be in use* in the consumer market **by 2020** (34.89% CAGR)

Source: https://www.forbes.com/sites/louiscolumbus/2018/06/06/10-charts-that-will-challenge-your-perspective-of-iots-growth/#3bd4e9cb3ecc IoT Analytics, The Top 10 IoT Segments in 2018 – based on 1,600 real IoT projects. The Industrial Internet of Things (IIoT): the business guide to Industrial IoT and other sources.

HYPERCONNECTED MARKETS (2/2)

«Alexa ora parla italiano.
Arriva lo speaker intelligente di Amazon.»
La Stampa– 24 Ottobre 2018

«Amazon Alexa arriva in Italia con la famiglia Amazon Echo: prezzo, data di uscita e tutto quello che c'è da sapere»
Corriere Della Sera – 24 Ottobre 2018



8,606,319,967
Mobile Connections

7,634,738,500
World Population

5,088,960,210
Unique Mobile Subscribers

Source: hhttps://www.hdblog.it/2018/07/11/connessioni-mobile-bankmycell-studio-smartphone/ https://www.corriere.it/tecnologia/cards/amazon-alexa-arriva-italia-la-famiglia-amazon-echo-prezzo-data-uscita-tutto-quello-che-c-sapere/amazon-alexa-parla-italiano_principale.shtml?refresh_ce-cp

NEW MARKET OPPORTUNITIES AND CONSTRAINTS

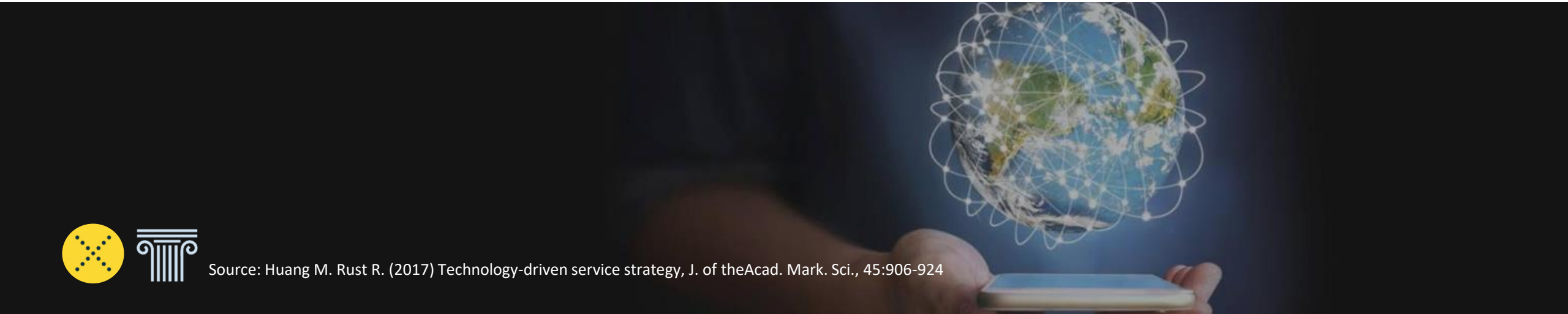
Technology is everywhere in goods and service, and is the primary source of product and service innovation. Given the rapid advances in technology that have characterized the modern world, it is unavoidable to incorporate technological change and its effect into our thinking on how best to design and manage innovation and marketing.

3 major evolutionary streams:

Change in **individual behaviour ("hyper" customer behavior) - psychological**

Change in **social behaviour ("hyper" social influence) - contextual**

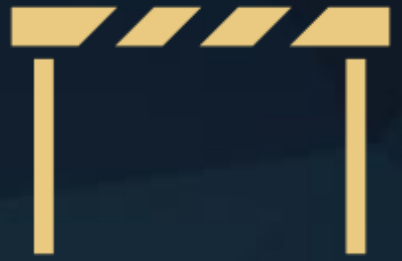
Change in "**smart-objects mediated" environment ("hyper" interaction) - ontological**



Source: Huang M. Rust R. (2017) Technology-driven service strategy, J. of theAcad. Mark. Sci., 45:906-924

NEW MARKET OPPORTUNITIES AND CONSTRAINTS

- **New ontology of smart objects** (anthropomorphism)
- **New relational space**
- **New role of individual and its clutural traits**
- **New segmentation criteria (attachment styles)**
- **New interpersonal relationships** (smart objects mediated)



- **Privacy concerns** (secondary use & not appropriate)
- **Intrusiveness**
- **Perceived uselesness**
- **Loss of self-control** (smart objects influencing behavior)

SMART OBJECTS POLIEDRIC ROLE

Individual – Object Relationship

The Smart Object is the subject of a dyadic relationships: the object itself is the subject of interaction.

Individual – Individual Relationship

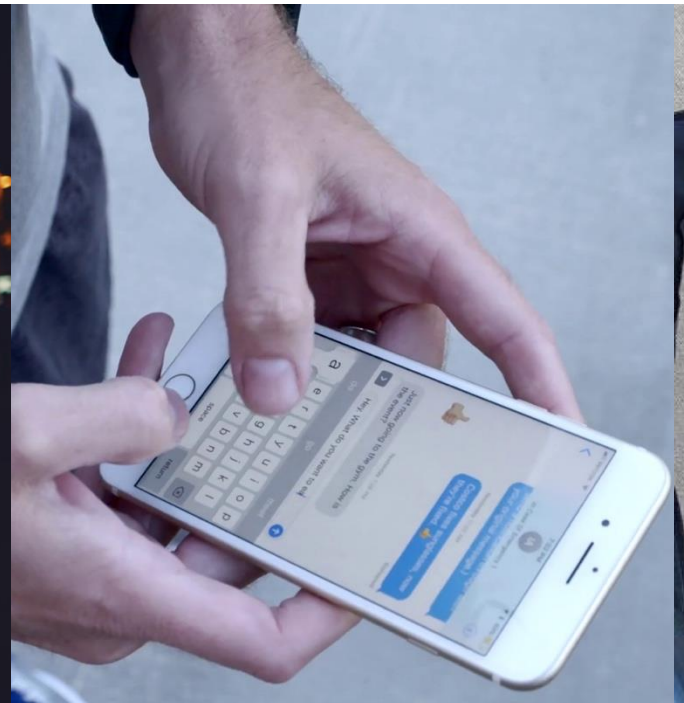
The Smart Object is a third element which madiates a relationship among different people

Individual – Social Relationship

The Smart Object influences individual and social behaviour

Object - Object Relationship

Non human-based area affecting individual and social behavior



NEW FRONTIERS IN CONSUMERS INTERACTIONS

Given the undeniable relevance of the evolution of interaction that is subsequent to smart-objects proliferation, **X.ITE Research Team** is running **3 Research Projects**, which try to explore both the role of smart-objects as subjects of the interaction (study 1; study 2) and the role of smart-objects as means (or facilitators/mediators) of interaction (study 3).

THE RELATIONSHIP BETWEEN CONSUMERS AND SMART-OBJECTS:
PRELIMINARY EVIDENCES ON CONSUMER HETEROGENEITIES
(Simona Romani, Paolo Peverini, Francesco Ricotta)

HUMANS VS ROBOTS:
WHY SOME CONSUMERS ENJOY INTERACTING WITH SMART OBJECTS.
(Simona Romani, Rumen Pozharliev, Patrizia Cherubino)

PSYCHO-SOCIAL SCIENCE APPROACH

WOM/SOCIAL COMMUNICATION IN A HYPERCONNECTED WORLD:
NOVEL INSIGHT FROM APPLIED NEUROSCIENCE.
(Matteo De Angelis, Rumen Pozharliev, Patrizia Cherubino)

NEUROSCIENTIFIC APPROACH

THE RELATIONSHIP BETWEEN CONSUMERS AND SMART-OBJECTS: PRELIMINARY EVIDENCES ON CONSUMER HETEROGENEITIES

Simona Romani, Paolo Peverini, Francesco Ricotta

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AGENDA

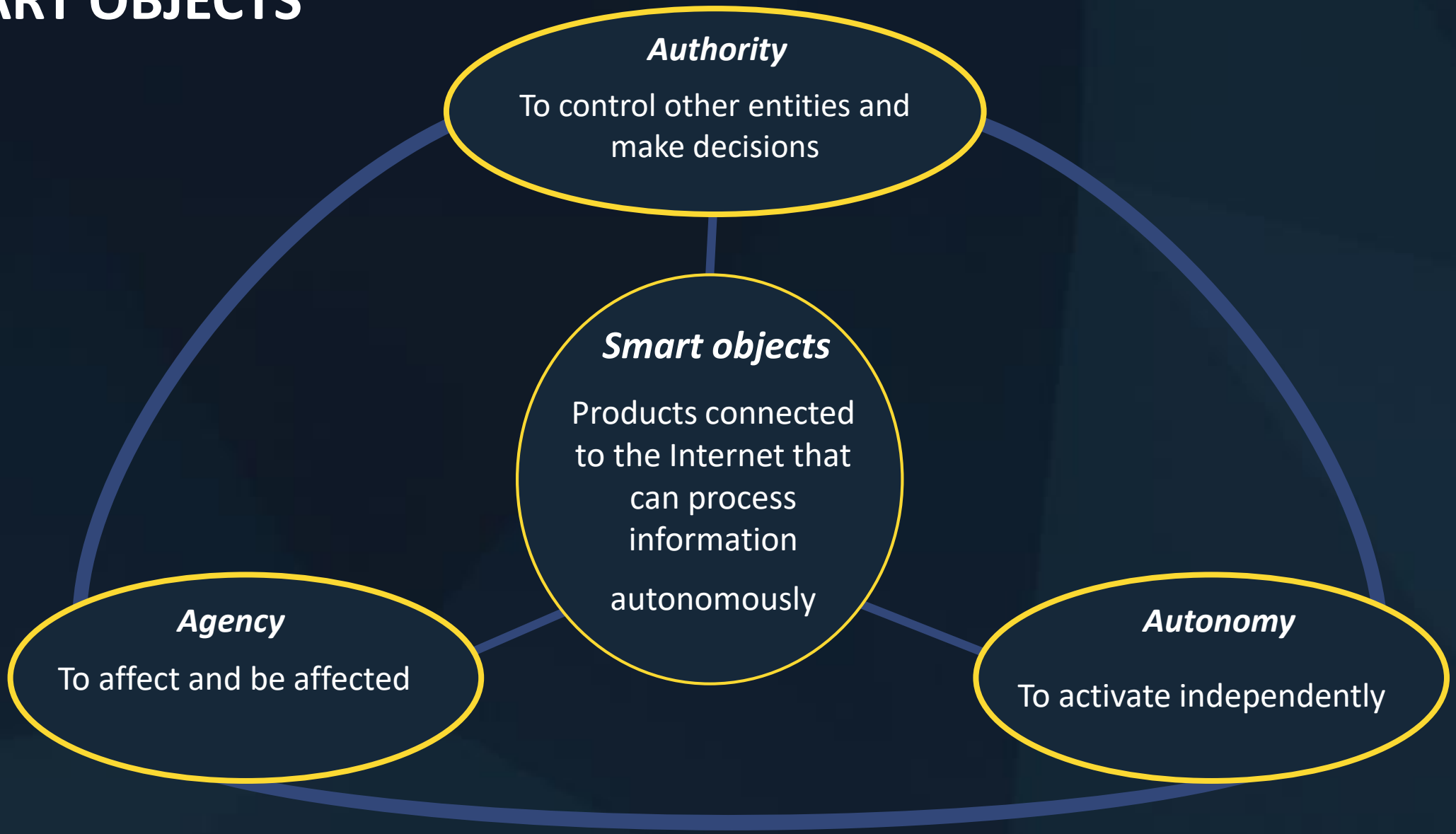
- RELATIONSHIPS BETWEEN CONSUMERS AND BRANDS/OBJECTS
- SMART OBJECTS
- RESEARCH QUESTION
- RESEARCH AVAILABLE
- METHOD: PROCEDURE AND CODING
- FINDINGS: PRELIMINARY EVIDENCES
- NEXT STEPS & OPEN QUESTIONS

RELATIONSHIPS BETWEEN CONSUMERS AND BRANDS/OBJECTS

- Beyond functionality
- Anthropomorphized brand/object
- Relationship norms (exchange vs communal)
- Attachment

Source: Belk (1988); Fournier (1998), Fournier & Alvarez (2012); Muniz & O'Guinn (2001); Park, Eisingerich & Park (2013) Aggarwal (2004); Kleine et al (1995); Thomson et al (2005); McInnins et al. (2017); Reeves and Nass (1996);

SMART OBJECTS



Source: Hoffman, D. L., & Novak, T. P. (2018). Consumer and object experience in the internet of things: An assemblage theory approach. Journal of Consumer Research, 44(6), 1178–1204

RESEARCH QUESTION

Do relationships **analogous to those existing between humans** manifest in the "smart object" space?

If so, typologies? Relational Styles? Roles?

RESEARCH AVAILABLE

Journal of the Academy of Marketing Science
https://doi.org/10.1007/s11747-018-0608-3

CONCEPTUAL/THEORETICAL PAPER

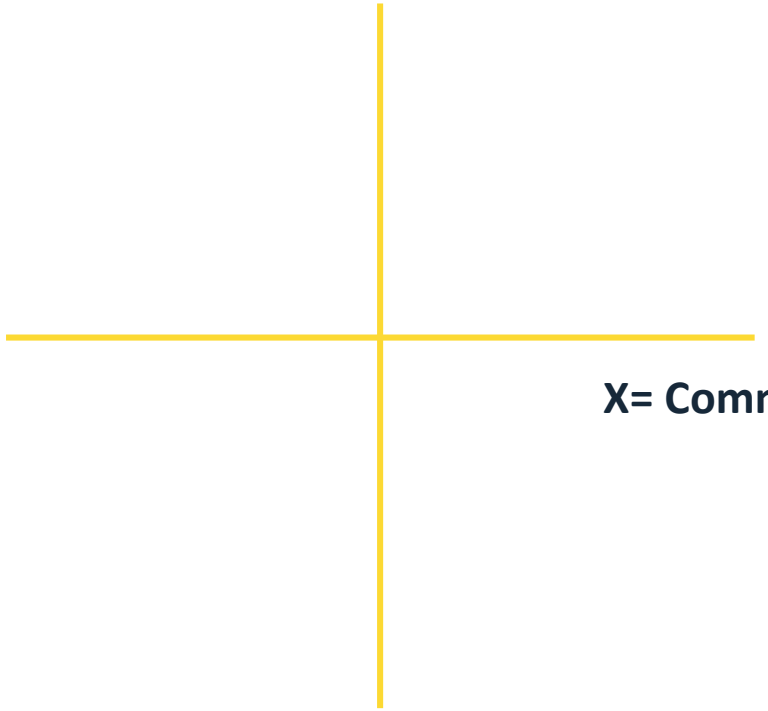
Relationship journeys in the internet of things: a new framework for understanding interactions between consumers and smart objects

Thomas P. Novak[1] · Donna L. Hoffman[1]

Received: 8 August 2017 / Accepted: 23 September 2018

Abstract
Consumers' interactions with smart objects have a relational nature, and extensive research has supported the "relationship metaphor" as a fruitful way to understand consumer responses to consumption objects. But, smart objects pose unique challenges for considering the emergence of consumer–object relationships, because their degrees of agency, autonomy, and authority lend them their *own* unique capacities for interaction. We present a new framework for consumer–object relationships based on the circumplex model of interpersonal complementarity and situated in assemblage theory and object-oriented ontology. Consumer–object relationship styles are defined in terms of two foundational dimensions of behavior, agency, and communion, based on the expressive roles played by consumer and object. The overlay of assemblage theory provides a conceptually rich understanding of the space of master–servant, partner, and unstable relationship styles, along with their concomitant positive (enabling) versus negative (constraining) consumer experiences. The model's underlying geometry supports extensive empirical work and provides a powerful managerial framework for measuring and tracking consumer–object relationships and the journeys they take over time.

Keywords Assemblage theory · Consumer journeys · Consumer experience · Object experience · Internet of things · Intelligent devices



X= Communality

Y = Agency

Source: Novak and Hoffman (2018); Horowitz et al. (2006)

METHOD: PROCEDURE AND CODING

- Qualitative explorative research
- In-depth interviews – ZMET technique
- 40 respondents
- Coding: themes and patterns of themes

Source: Zaltman, Coulter (1995, 1997)

FINDINGS: PRELIMINARY EVIDENCES

Relationships

MASTER/SERVANT

"Immagino anche un tostapane smart collegato a un telefono in modo che tu possa selezionare non solo a quale ora vuoi che il toast sia pronto, ma addirittura quale «settaggio», tipo quanto lo vuoi abbrustolito alla fine. È una questione di personalizzazione in modo che la routine quotidiana possa andare tranquilla e liscia"

Leonardo, 24
HIGHLY OPTIMISTIC
NON-USER
AWARE (NOT EXPERT)
TRUSTFUL

CONSUMER PERSPECTIVE

- **Object role**: servant
- **Valence**: positive
- **Reciprocity**: yes
- **Correspondence**: yes
- **Agency**: high
- **Communal**: medium
- **Strength**: strong
- **Power (control):** high

STALKER/PREY

"…questo occhio che guarda attraverso il buco di una serratura che mi dà l'idea giustamente di una sorveglianza… essere sorvegliato continuamente…mi dà l'idea che ci sia sempre qualcuno che…a spiare, a controllare…è inquietante…"

Domenico, 27
OPTIMISTIC
USER
AWARE (EXPERT)
CONCERNED ABOUT PRIVACY ISSUES

CONSUMER PERSPECTIVE

- **Object role**: stalker (big brother)
- **Valence**: negative
- **Reciprocity**: yes
- **Correspondence**: yes
- **Agency**: low
- **Communal**: high
- **Strength**: strong
- **Power (control):** low
- **Power imbalance**: high
- **Pathology**: no

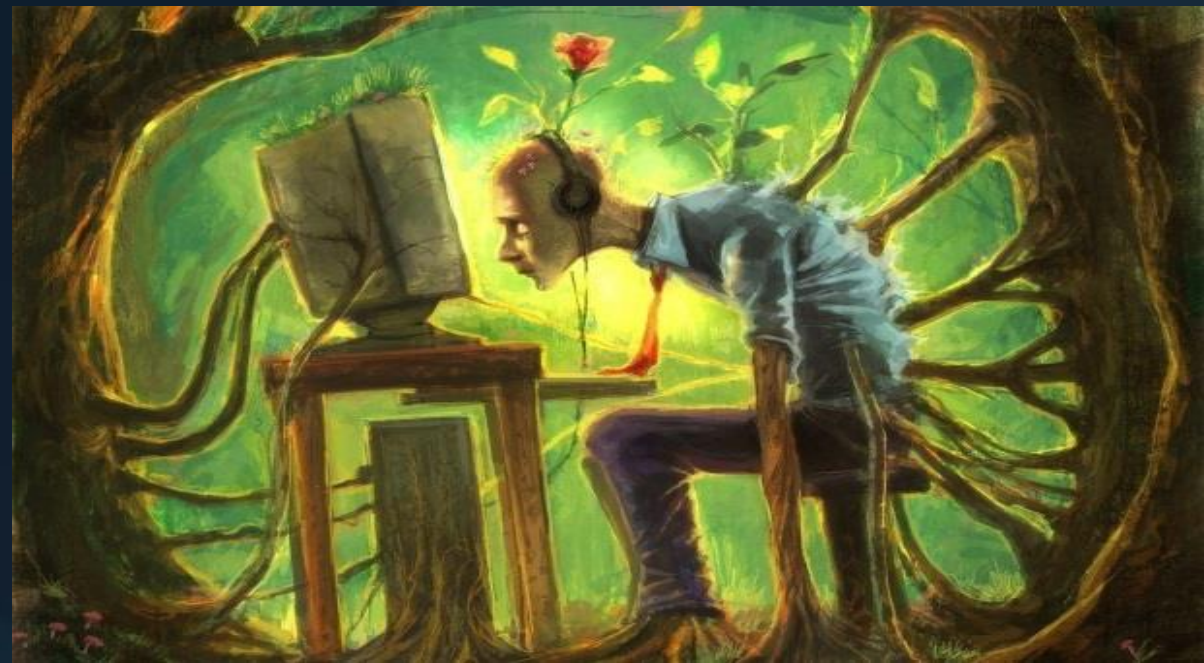
DEALER/ADDICT

"…è un uomo seduto davanti a un PC, avvolto… come se ne facesse parte, come se stesse lì seduto da tanto tempo… tanto da inglobarsi con questo PC… è imbambolato, preso da questa rete di informazioni e cerca di assimilarne il più possibile… è un aspetto negativo, è una visione apocalittica. Nel film Terminator si parlava del fatto che i PC avrebbero preso il controllo del mondo […] questa tecnologia […] ti coinvolge tanto […] questa foto è abbastanza inquietante…"

Simone, 28
OPTIMISTIC
LIGHT USER
HIGHLY AWARE
CONCERNED ABOUT PRIVACY ISSUES

CONSUMER PERSPECTIVE

- **Object role: dealer**
- **Valence: negative**
- **Reciprocity: yes**
- **Correspondence: yes**
- **Agency: low**
- **Communal: high**
- **Strength: strong**
- **Power (control): low**
- **Power imbalance: no**
- **Pathology: high**



CAPTOR/HOSTAGE

"…ciò che invece mi preoccuperebbe tanto è sapere che in realtà ho una smart home in cui si verifica un blackout io sono praticamente prigioniera e questo l'ho associato all'immagine in cui c'è la casa che sembra un po' un mostro. Questo mi fa venire un po' di ansia…"

Milena, 33
OPTIMISTIC
NON-USER
AWARE (NOT EXPERT)
CONCERNED ABOUT PRIVACY ISSUES

CONSUMER PERSPECTIVE

- **Object role: captor**
- **Valence: negative**
- **Reciprocity: yes**
- **Correspondence: yes**
- **Agency: low**
- **Communal: high**
- **Strength: weak**
- **Power (control): low**
- **Power imbalance: medium**
- **Pathology: no**

NEXT STEPS & OPEN QUESTIONS

- Dimensions for a new relationship space
- Beyond positivity and strenght
- The centrality of ambivalence (privacy concern)
- The role of individual and cultural traits
- Metrics for success (coping with negative relationships)

Stalker jailed for using drone to spy on victim and her family

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Amazon Alexa

Amazon's Alexa recorded private conversation and sent it to random contact

THE WALL STREET JOURNAL.

Home World U.S. Politics Economy Business Tech Markets Opinion Life & Arts Real Estate WSJ. Magazine

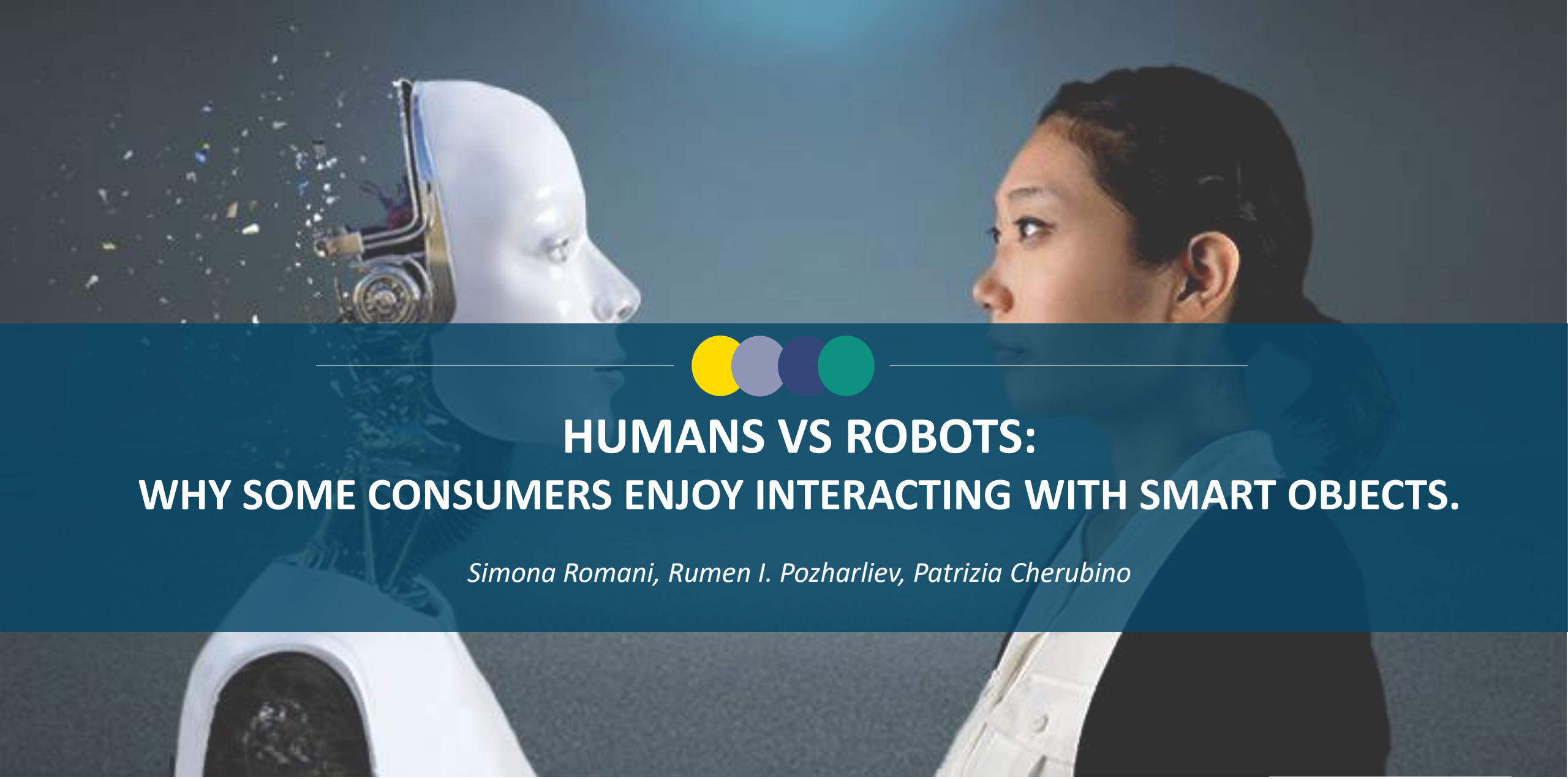
A-HED

Cocaine, Reefer and the F-Word: Sometimes Alexa and Google Home Go a Little Crazy

Amazon's Echo device and Alphabet Inc.'s Google Home can handle a growing array of tasks—they are also freaking people out

The New York Times

Thermostats, Locks and Lights: Digital Tools of Domestic Abuse



HUMANS VS ROBOTS:
WHY SOME CONSUMERS ENJOY INTERACTING WITH SMART OBJECTS.

Simona Romani, Rumen I. Pozharliev, Patrizia Cherubino

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AGENDA

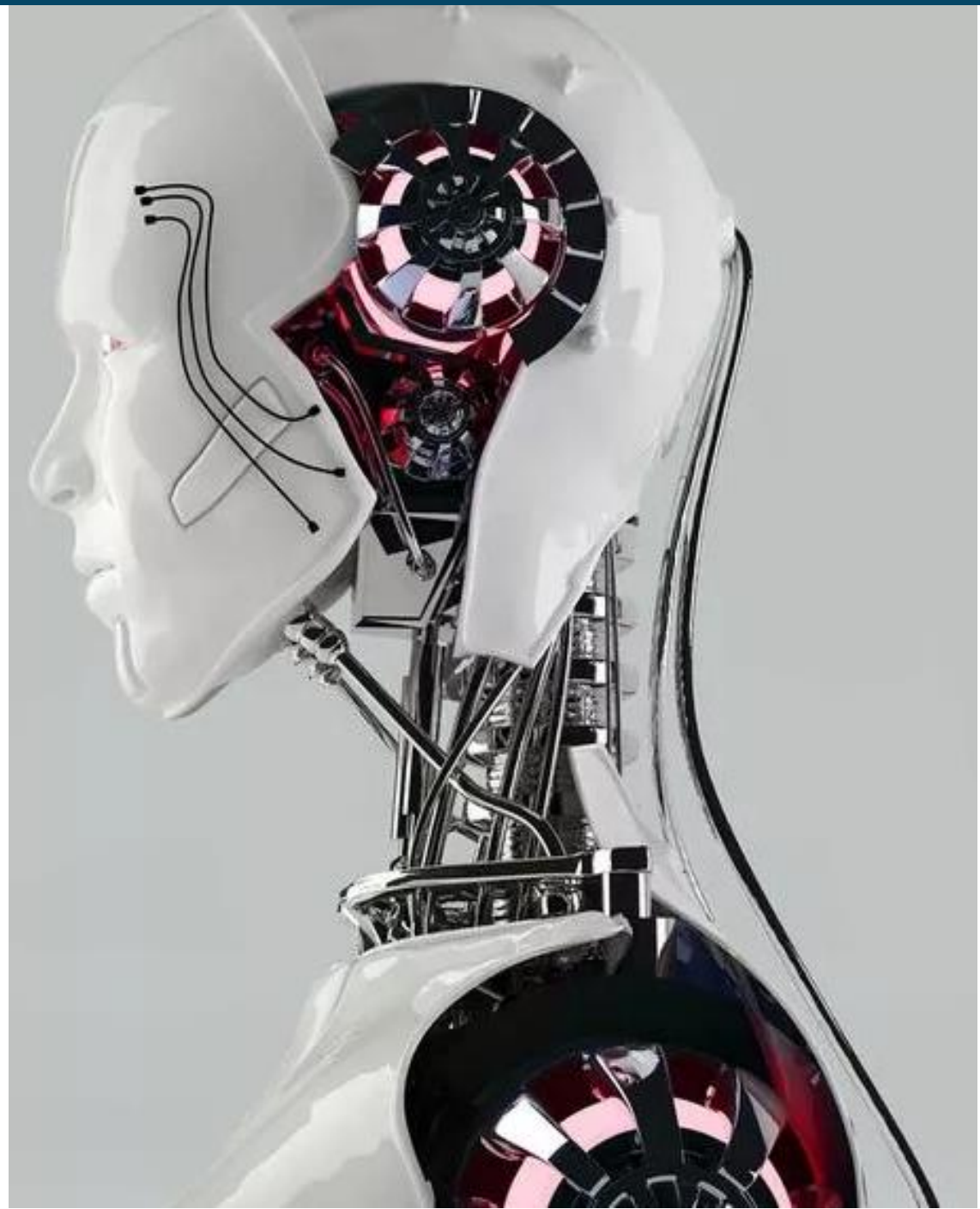
- SMART OBJECTS AND ATTACHMENT THEORY
- RESEARCH QUESTION
- RESEARCH OBJECTIVES
- HYPOTHESIS AND EXPERIMENT PROCEDURE
- MANAGERIAL IMPLICATIONS

WHY SMART-OBJECTS

The rapid growth of technology (e.g. social networks, smart objects, IoT, AI, biometrics) has caused major changes in human behavior and lifestyle.

New generation of service robots are designed to interact with people and help them in everyday life

People form strong intimate attachment to objects because of several reasons: psychological health, greater life satisfaction, better mood and reduced stress.



ATTACHMENT THEORY

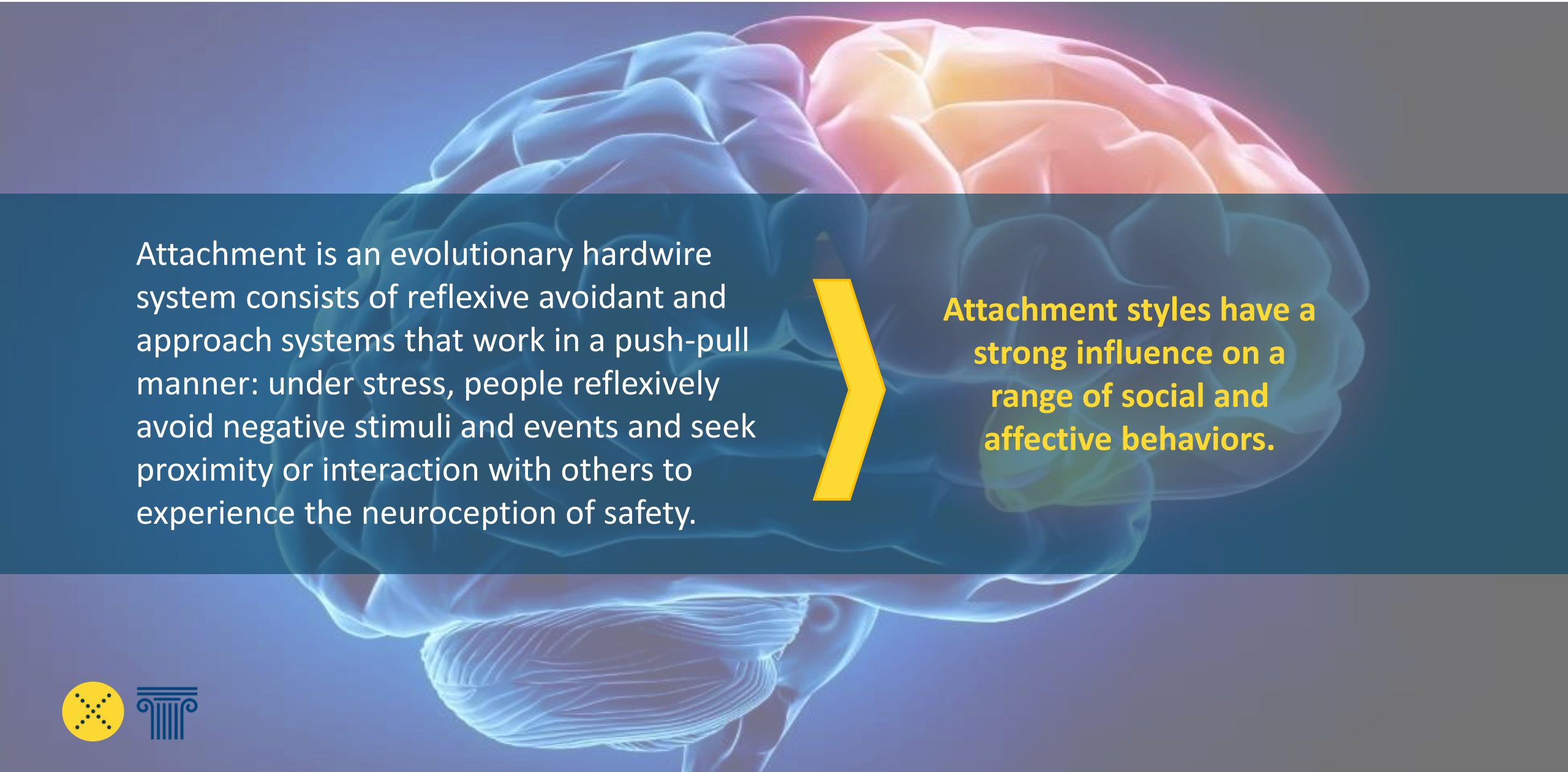
The proximity of significant other provides a sense of security while the absence leads to stress.

In the absence or unreliability of primary attachment figure, humans search for alternatives that can provide a sense of security.

This search of compensatory attachment targets may include non-human targets, which in turn may explain why humans develop attachment toward places, animals, and event to material objects.

Previous literature identifies three adult attachment styles: **anxious, avoidant, secure.**

NEUROLOGICAL PERSPECTIVE



Attachment is an evolutionary hardwire system consists of reflexive avoidant and approach systems that work in a push-pull manner: under stress, people reflexively avoid negative stimuli and events and seek proximity or interaction with others to experience the neuroception of safety.

Attachment styles have a strong influence on a range of social and affective behaviors.

RESEARCH QUESTION

Explore whether **interpersonal attachment style affects** the humans cognitive, behavioral, and emotions responses **toward intelligent technology** and whether these responses can lead to preference for interaction with robots compared to humans.

RESEARCH OBJECTIVES

Anxiously attached people will show **different neurophysiological responses when interacting with intelligent technology compared to humans.**

Interaction with intelligent technology compared to humans is a situation that does not involve **risks of acceptance or rejection** for the individual and thus might be perceived and/or experienced as less stressful.

Anxiously attached compared to secure people might be more predisposed to adopt intelligent technology due to the low probability of negative emotional experience which will be translated in higher quality of social interaction and service.

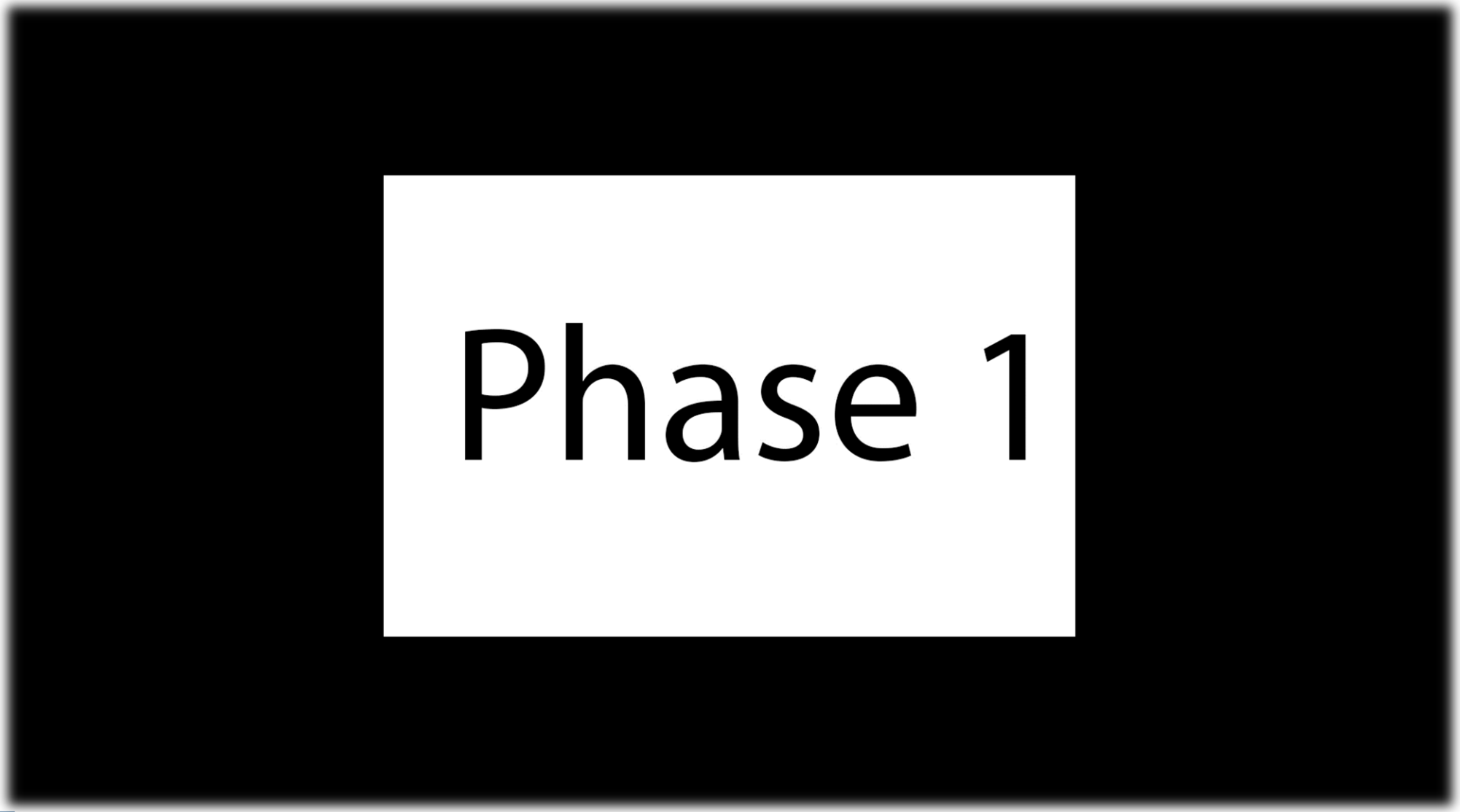
HYPOTHESIS

Two dimensions:

1. Attachment Anxious (**Low vs High**)
2. Stimulus Interaction (**Human vs Robot**).

- **H1**: Higher neurophysiological activations associated with experiencing reward/positive emotions when person (**high anxious attachment**) reading/watching/interacting **with robot** compared to interacting with human.
- **H2**: Higher neurophysiological activations associated with experiencing reward/positive emotions when person (**high secure attachment**) reading/watching/interacting **with human** compared to interacting with robot.

EXPERIMENT PROCEDURE



DATA COLLECTION

During the experiment, data will be collected from the subjects thanks to:

Electroencephalographic (EEG)

Blood Volume Pressure (BVP)

Galvanic Skin Response (GSR)

Eye-tracker

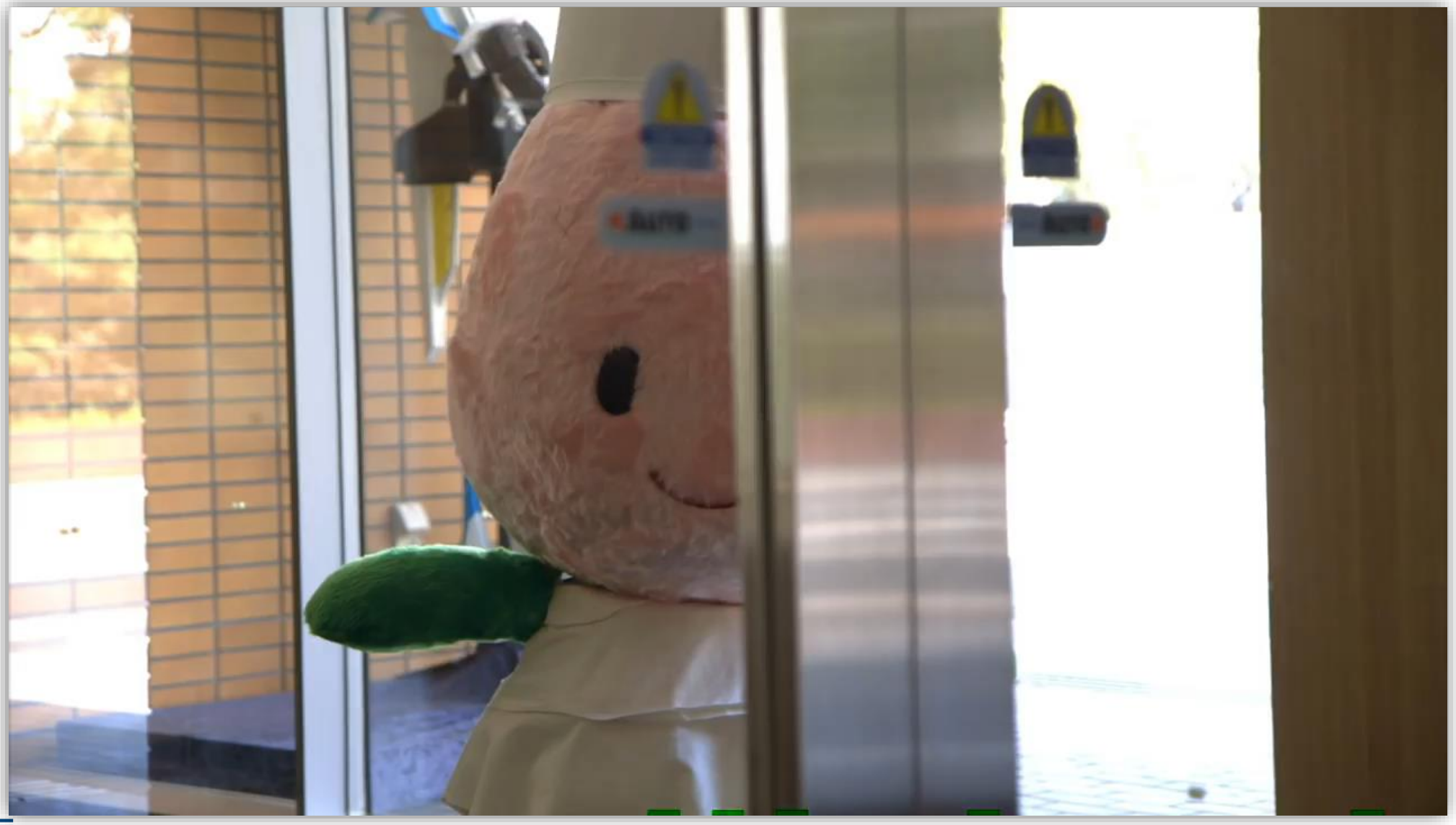
Before the acquisition it will be recorded 60 seconds during which the subject keep his eyes closed and similarly 60 seconds with open eyes, to obtain his baseline activity of the neurophysiological signals.

MANAGERIAL IMPLICATIONS

Association between attachment styles and intelligent technology can provide a **novel customer segmentation criteria.**

- Anxiously attached individuals are willing to purchase a smart objects or a robot with specific personality characteristics. Thus, it could be that specific interpersonal attachment style serve as a barrier in smart-object adoption.
- Individual interpersonal attachment styles and object attachment information available from online sources such as social media (e.g., facebook, linkedin, twitter etc.) could generate insights useful to enhance the quality and impact of communication campaigns.

ROBOT APPLICATION IN HOTEL INDUSTRY



WOM/SOCIAL COMMUNICATION IN A HYPERCONNECTED WORLD: NOVEL INSIGHT FROM APPLIED NEUROSCIENCE.

Matteo De Angelis, Rumen I. Pozharliev, Patrizia Cherubino

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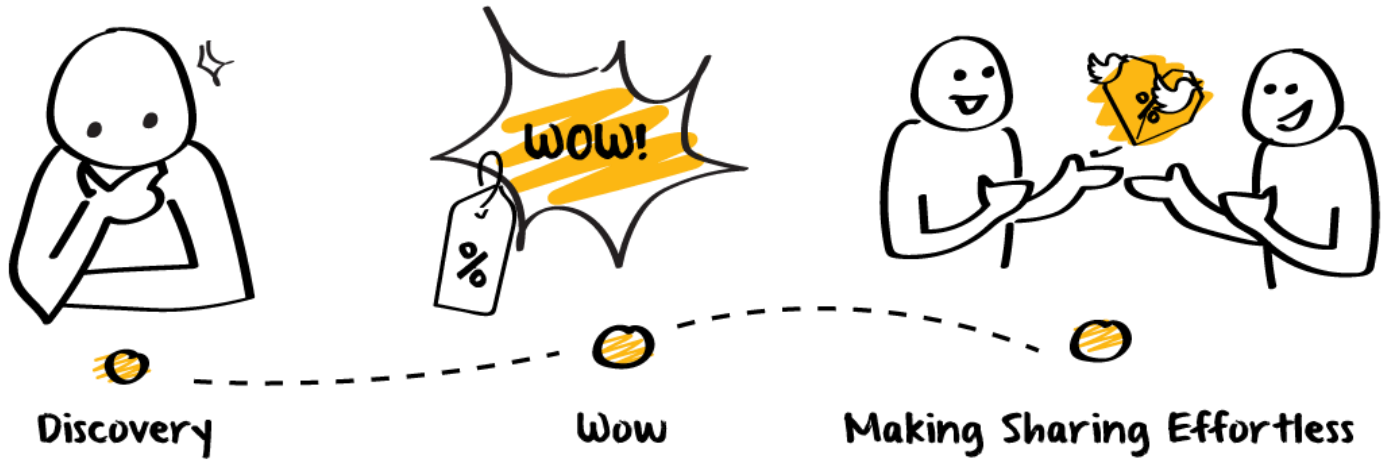
AGENDA

- WHY WORD-OF-MOUTH
- RESEARCH QUESTION
- RESEARCH OBJECTIVES
- HYPOTHESIS AND EXPERIMENT PROCEDURE
- MANAGERIAL IMPLICATIONS

WHY WORD-OF-MOUTH

In a digitalized and hyperconnected society, the role of **“informal communications directed to other consumers”** is increasing in importance.

Today people share **billions of** messages information **and** experiences of different kind with other individuals, and word-of-mouth often have a deep impact on consumer purchasing behavior.



WOM DIRECTLY IMPACTS BUSINESS PERFORMANCE

The Word of Mouth Marketing Association (**WOMMA**) found these evidences about WOM:

- WOM **drives 13% of sales** (paid marketing in total drives 20-30% of sales)
- Offline WOM produces **2/3 of the impact**; online 1/3
- WOM **amplifies the effect of paid media by 15%**
- WOM has a more **immediate impact** than traditional advertising – most is in the first two weeks
- One offline WOM impression drives sales at least **5 times more** than one paid media impression, and much more (as much as **200 times more**) for high-consideration categories

Source: LANDMARK Study. Return on Word of Mouth. *WOMMA Word of Mouth Marketing Association,* November 2014

WOM DRIVING FORCE

But why do people share one type of information with their close social ties and other type of information with strangers?

It depends on different psychological factors such as:

self-enhancement

need to help or protect others

social bonding

advice seeking

emotion regulation etc…

RESEARCH QUESTION

Investigate the effect of **interpersonal closeness** on the tendency to share either **positive or negative WOM**, in order to understand the reasons and motivations for sharing information with others.

RESEARCH OBJECTIVES

*Using **neurophysiological metrics** to study the association between WOM behavior and neural, biological and cognitive mechanisms associated with attention, emotional experience and reward provides in order to understand **motivations and physiological processes that influence WOM behavior.***

RESEARCH PROCEDURE

First, testing whether the valence of information shared influences the **neurophysiological mechanisms associated with reward**.

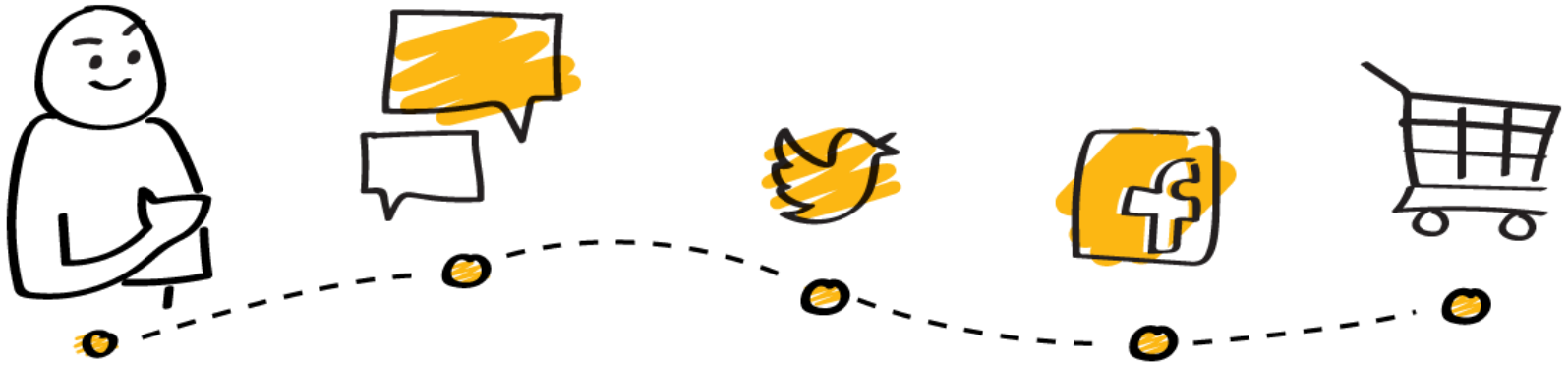
Second, studying whether the type of audience one talks to influences the valence of information shared, and more specifically whether the **interpersonal closeness** between WOM sharer and recipient affects the system of neural and biological mechanisms that respond to the anticipation and/or receipt of reward.

Third, using a combination of neuro and biological indicators including **Electroencephalography** (EEG), **Heart rate** (HR), **Galvanic Skin Response** (GSR), **Facial Coding** and **hormonal responses** associated with reward.

FUTURE RESEARCH QUESTION

Interpersonal closeness plays an important role in WOM dynamics in driving an individuals' propensity to share positive versus negative WOM.

While people tend to share positive information with strangers to self-enhance, they share negative information with friends to protect them.



Talking to other people the sharer feels distant from (i.e., **strangers**) increases the likelihood to share positive information; while talking to people he/she feels close to (i.e., **friends**) increases the likelihood to share negative information.

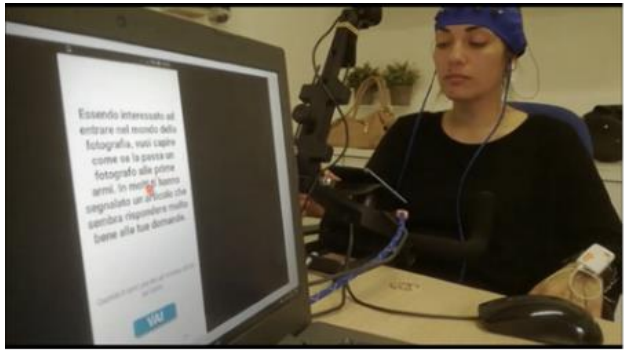
HYPOTHESIS

Studying how the same neural mechanisms relate to WOM behavior and whether their activation is affected by the valence of information shared and the interpersonal closeness between WOM sharer and recipient.

- **H1**: Higher neurophysiological activations (EEG frontal asymmetry; enhanced HR and GSR; increased T-levels) associated with experiencing reward (reward of protecting others) when person (high interpersonal closeness) **communicates to a friend NWOM versus PWOM.**
- **H2**: Higher neurophysiological activations (EEG frontal asymmetry; enhanced HR and GSR; increased T-levels) associated with experiencing reward (reward of self-enhancement) when person (low interpersonal closeness) **communicates to a stranger PWOM versus NWOM.**

EXPERIMENT PROCEDURE

Three sessions and the subjects will be participate in couple, so to have two different subgroups (close vs distant).



Session One

1. Sharer reads an ad message describing the characteristics of a product. We use **eye-tracking** to analyze his viewing behavior and the amount of attention allocated to the different pieces of information.

Session Two

2. Sharer writes down the information that he intends to share with the recipient of the information. We use **EEG, GSR and HR** to measure his emotional experience when deciding on the type of information he intends to share with the recipient.

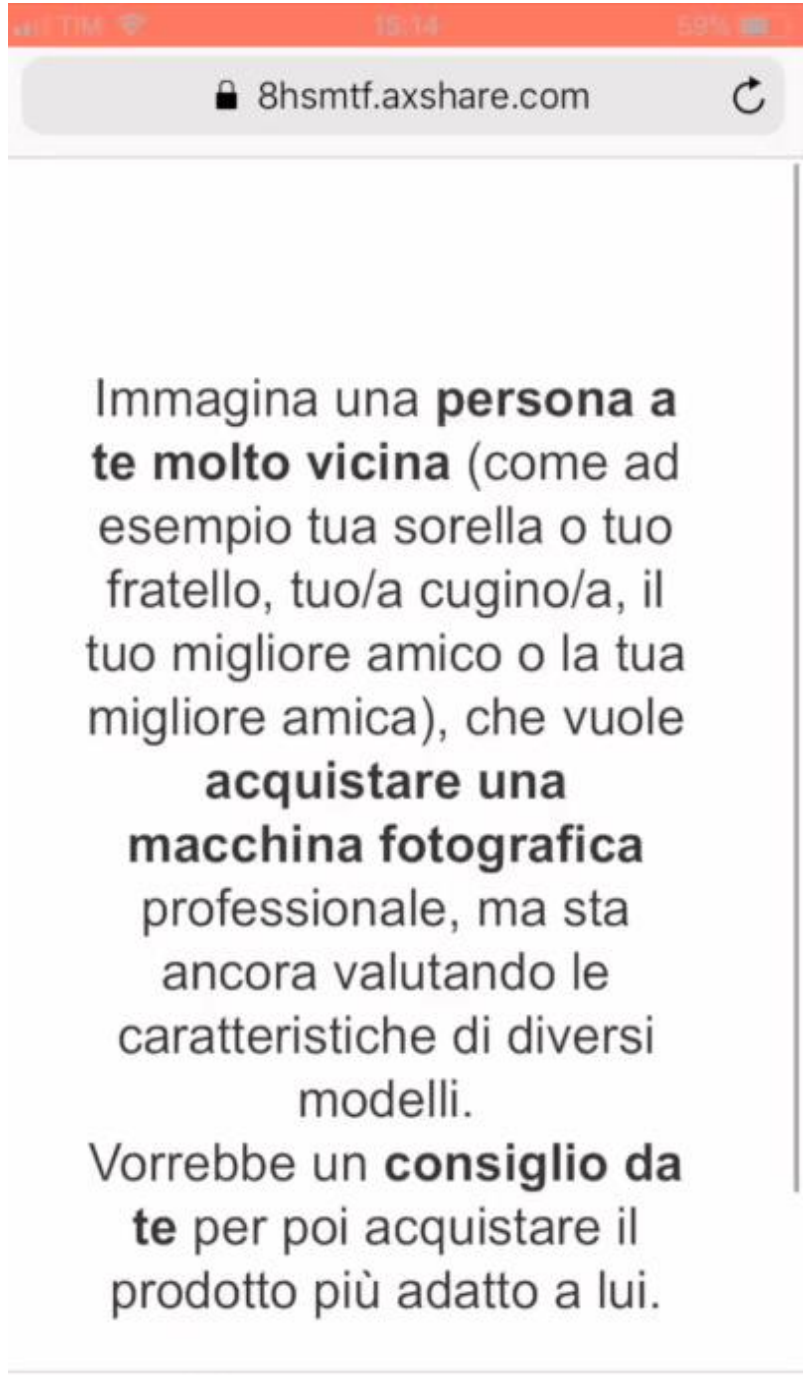
Session Three

3. Sharer and recipient interact. The sharer verbally shares the information with the recipient. We collect **EEG, GSR and HR** data from both the sharer and the recipient.

EXPERIMENTAL DESIGN

Two dimensions:

1. Condition (**Friend vs Stranger**)
2. Valence (**Positive vs Negative**)



MANAGERIAL IMPLICATIONS

- To encourage consumers to share positive WOM in weakly-tied networks and communities, such as LinkedIn, (rather than in strongly-tied communities, such as WhatsApp or Facebook), where people typically find sharing positive information about themselves particularly rewarding. Also, our expected results would urge marketers to adopt a novel approach to negative WOM.

- To stimulate companies to use consumer neuroscience not only to understand consumers' neurophysiological reactions to advertising or product strategies but also to understand what type of WOM content might be particularly rewarding for consumers to share.

SMART OBJECTS: CONVERSATIONAL AGENT

RESEARCH STORM & FUTURE RESEARCH

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FUTURE RESEARCH DIRECTION

How does the **aesthetic appearance of a smart object** (e.g. classic robot vs. human-looking robot vs. animal-looking robot) affects **consumers' emotional and cognitive experience**?

How do **smart objects communications and interactions** affect consumers' attitude and purchase intentions?

How does **smart-object mediated environment** affect social influence, WOM, social communication and influencer marketing effectiveness?


ASK MORE
QUESTIONS

THANK YOU!

X.ITE Research Team

III X.ITE RESEARCH STORM - 2018

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