Next Level Media Engagement

Measuring Cross-platform Video Consumption Processes with Wearable Sensor Data

Dr. Lisa-Charlotte Wolter
Head of NeuroLab and Brand & Consumer Research,
Hamburg Media School
Affiliated Researcher University of Florida
l.wolter@hamburgmediaschool.com

Sylvia Chan-Olmsted, Ph.D.
Professor - Department of Telecommunication,
Director of Media Consumer Research
University of Florida
chanolmsted@jou.ufl.edu

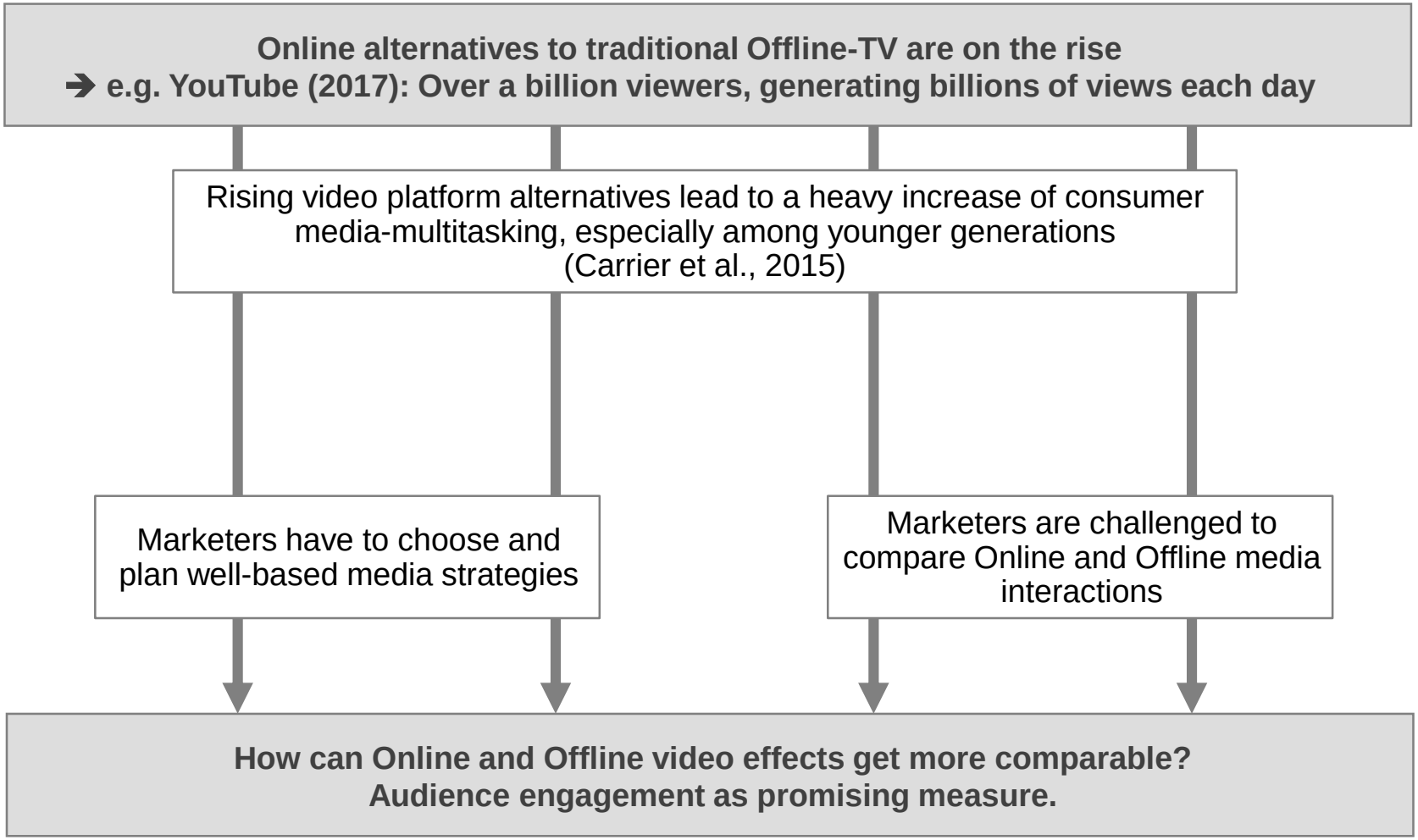
Daniel McDuff, Ph.D.
Researcher, Microsoft Research, Redmond, USA
danjmcduff@gmail.com

Dinah Lutz
Researcher NeuroLab and Brand & Consumer Research,
Hamburg Media School
d.lutz3@hamburgmediaschool.com

A. Introduction

Marketing communication in a changing media environment

Exploring cross-platform video communication



UF UNIVERSITY of FLORIDA HAMBURG MEDIA SCHOOL

Challenge: Approaching the Affective Dimension of Engagement

Wearable sensor data to understand affective dimensions across platforms

- Emotions are hard to verbalize, which is why neurophysiological data play an increasingly important role in marketing research
  - Potential of physiological data to capture “emotion, arousal and engagement” (Kumar et al., 2013, p.336)

- A promising option among neurophysiological approaches: wearable sensors to measure heart rate and electrodermal activity (EDA)
  - **Heart rate**: can explain the valence of an emotional response (Lang, 1990), but its role in the context of cross-platform media engagement needs to be explored further
  - **EDA**: assesses the electric properties of the skin and counts as a valid and sensitive indicator of (possibly unconsciously) experienced arousal (Boucsein, 2012; Braithwate et al., 2013)

Heart rate and EDA are promising measures of affective engagement with different platforms. Wearable sensors have the potential to measure them on scale.

Research Question

Main objective of the study

1	***How do TV and online video differ in terms of affective engagement, measured by wearable sensor heart rate data?***
2	***How do TV and online video differ in terms of affective engagement, measured by wearable sensor skin conductance data?***

- In the next step, we aim to connect the physiological data with cognitive and behavioral data

UF UNIVERSITY of FLORIDA HAMBURG MEDIA SCHOOL

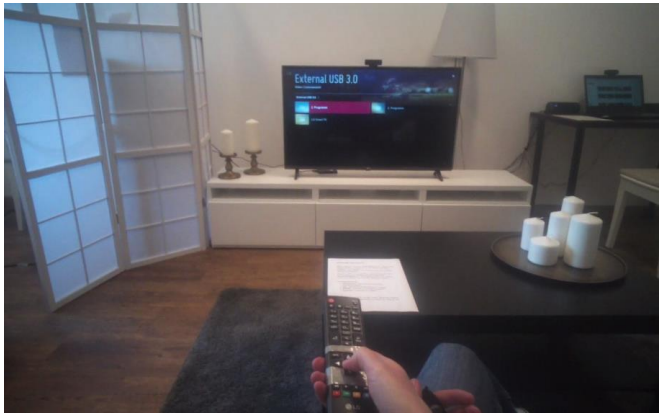
C. Study Design

Mixed-Methods Design to gather engagement three-dimensionally

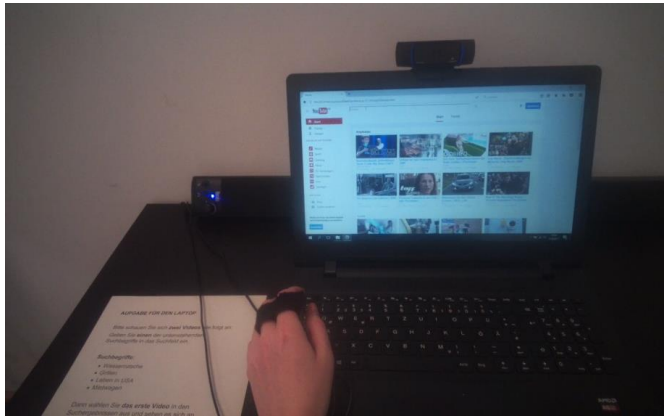
Implicit data collection in a living room lab and explicit data collection through questionnaire

1 **Task:** watch 2 videos on each platform, while wearing the Empatica E4 to measure heart rate and EDA (**affective variable**) and wearing mobile eyetracking glasses (control measure for attention)

➔ Optional: Use own smartphone if bored by the content (**behavioral variable**)



TV task: choose one video each out of two folders (each containing either informational content only or entertaining content only). (15min.per video)



YouTube task: choose one out of 4 keywords (leading to only entertaining or only informational content), then choose video suggestion from side bar (leading to only the content type not yet seen) (5min.)

2 **Task:** fill out online questionnaire
➔ **Cognitive (explicit) variable**: perceived media platform quality, willingness to share, etc.

UF UNIVERSITY of FLORIDA HAMBURG MEDIA SCHOOL

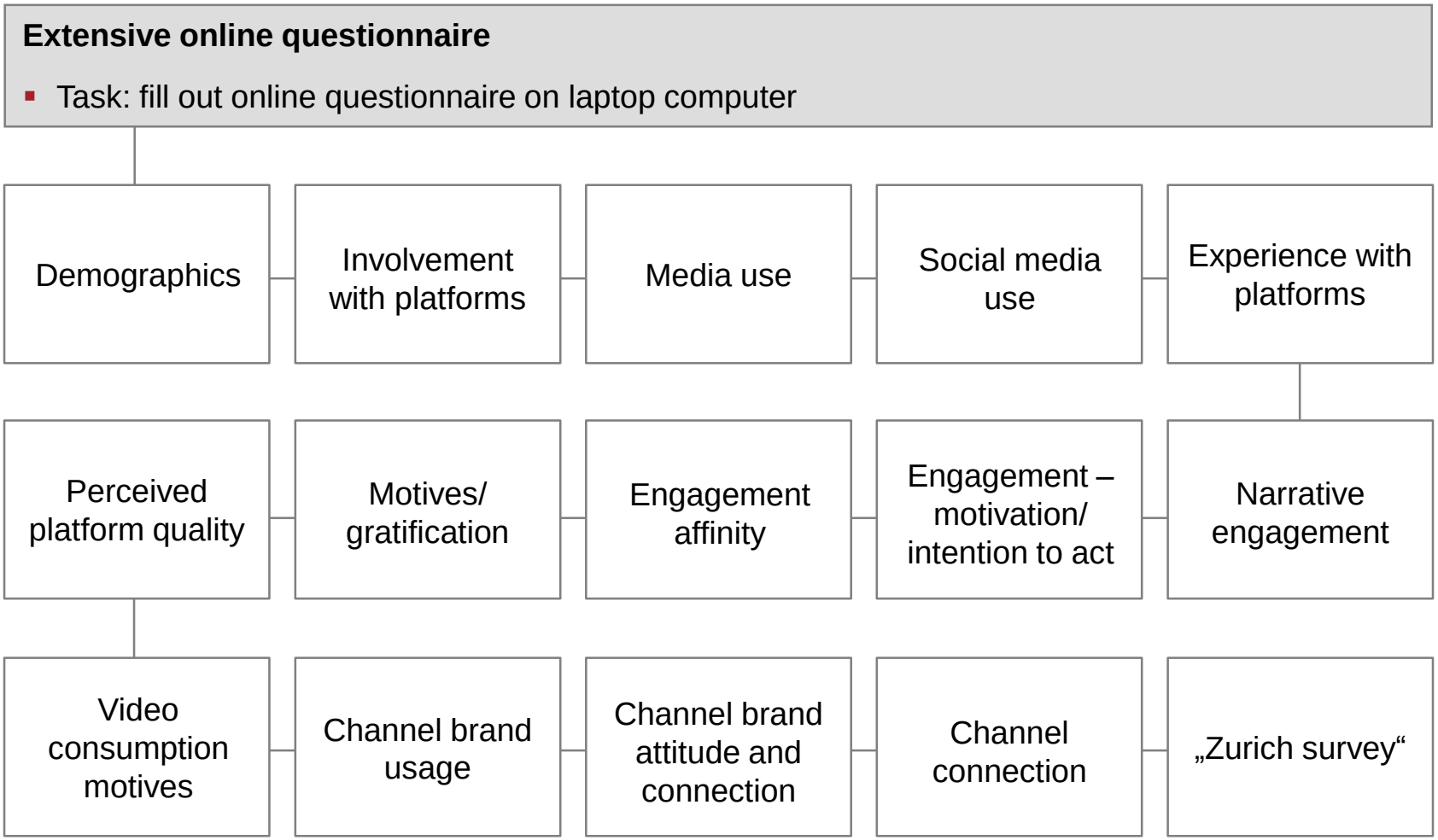
Empatica E4 wristband

A wearable research device that offers real-time physiological data acquisition

- Measures the constantly fluctuating changes in the electric properties of the skin
- Until now, the Empatica wristband has mainly been used for medical studies
- We use it to build on existing marketing/consumer as well as psychological research, e.g.:
  - **Heart rate:** Investigation of
    - affective responses to advertising content (Lang, 1990)
  - **EDA:** Research of
    - purchase behavior and emotional responses to varying price levels (Somervuori, & Ravaja, 2013)
    - EDA as an indicator for the role of customers' arousal for retail stores (Groeppel-Klein, & Baun, 2001)
    - skin conductance as a better predictor of market performance than self report measures (La Barbera, & Tucciarone, 1995)

Data Gathering Process

Part 2: Explicit



Selected Content

Entertaining and informational content matched for both platforms

	Entertaining Content	Informational Content
TV ~ 15 min	▪ The Big Bang Theory (sitcom, ProSieben) ▪ Little Big Stars (talent show, Sat.1) ▪ Inas Nacht (late-night talk show, ARD) ▪ Dittsche (improvised sitcom, Dritte Programme) ➡ program until ad break	▪ Galileo (knowledge magazine, ProSieben, *topic: Life of Germans in San Francisco*) ▪ Galileo (knowledge magazine, ProSieben, *topic: Waterpark in Saudi Arabia*) ▪ Wiso (consumer magazine, ZDF, *topic: Vacation swap*) ▪ Marktcheck (consumer magazine, Dritte Programme, *topic: Barbecue*)
YouTube ~ 5 min	▪ The Big Bang Theory (sitcom, ProSieben) ▪ Little Big Stars (talent show, Sat.1) ▪ Inas Nacht (late-night talk show, ARD) ▪ Dittsche (improvised sitcom, Dritte Programme) ➡ highlight clips (coherent scenes)	▪ Galileo (knowledge magazine, ProSieben, topic: *German fitness trainer in USA*) ▪ Galileo (knowledge magazine, ProSieben, topic: *Stand-up water slide*) ▪ Wiso (consumer magazine, ZDF, topic: *Car rental for vacations*) ▪ Marktcheck (consumer magazine, Dritte Programme, topic: *Barbecue meat*)

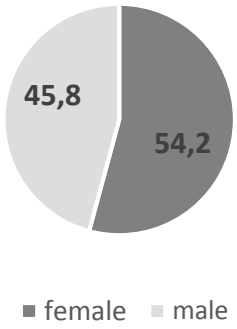
D. Research Findings

Sample of the study

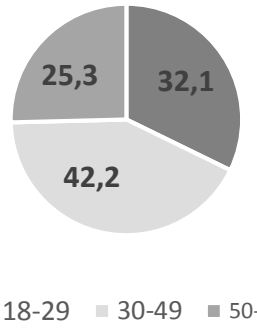
Participants recruited based on realistic TV/Online Video target

249 participants

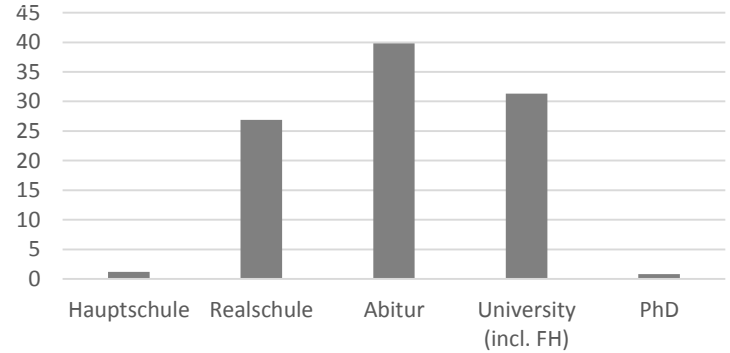
in 33 days (on average 8 per day)



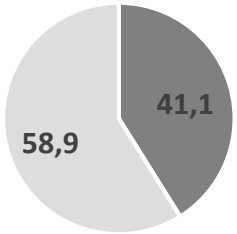
Gender (in %)



Age groups (in %)



Education (in %)

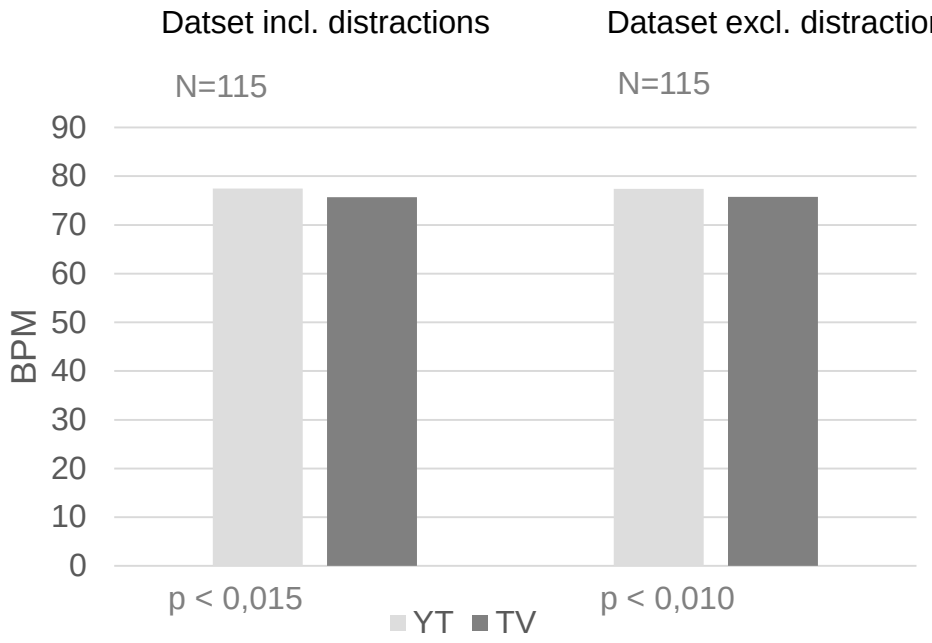


Use of smartphone (in %)

N=236

TV vs. YouTube – Heart Rate

Affective engagement of platforms

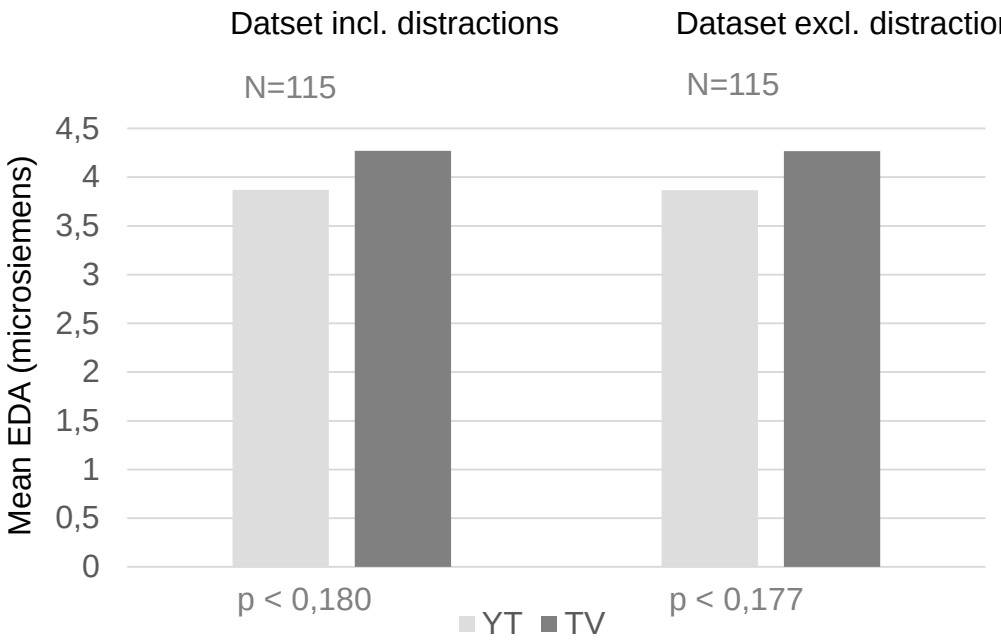


- Q: Do engagement/motivational processes differ depending on the platform?
- Result: **Yes**. There are significant differences between TV and YouTube in both data sets
- **YT > TV**
- **Attention impact:** The main effect does not change between incl./excl. distraction data sets

Method: paired T-test

TV vs. YouTube – EDA

Affective engagement of platforms



- Q: Do engagement/motivational processes differ depending on the platform?
- A: **No**. There is no significant effect
- **Attention impact:** The main effect does not change between incl./excl. distraction data sets

Method: paired T-test

EDA, Heart Rate and Behavioral Measures

Exploring the relation between engagement dimensions – TV vs. YouTube

	Implicit Measures	
Engagement / Research Questions	**EDA**	**Heart Rate**
1. TV vs YouTube	- *TV>YT*	✓ TV<YT
2. Smartphone Usage (Behavioral)	SU<YT SU<TV	SU=TV SU>YT

UF UNIVERSITY of FLORIDA

HAMBURG MEDIA SCHOOL

Limitations & Outlook

What's next?

▪ Exploratory research design	▪ Validation by replication
▪ German media user sample	▪ Include media users from other countries
▪ Lab-based situation	▪ Use of wearable sensor data out of the lab & in real-life situations
▪ Interpretation issues of heart rate	▪ Combination with other implicit tools and/or more explicit survey and behavioral data

For further information and implications please contact:

Dr. Lisa-Charlotte Wolter
l.wolter@hamburgmediaschool.com

UF UNIVERSITY of FLORIDA

HAMBURG MEDIA SCHOOL