

ICKM suceg | 2019

*15° International Conference on Knowledge Management
2° Internatoinal Seminar on Corporate Universities and Government Schools*

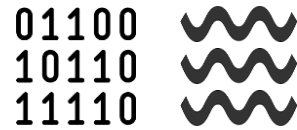


INTERNATIONAL COUNCIL ON
KNOWLEDGE MANAGEMENT



Good Reviews, Bad Reviews, Fake Reviews: Managing Knowledge in the Era of Social Media

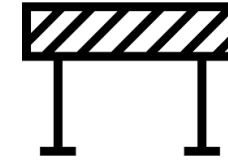
Alton Chua



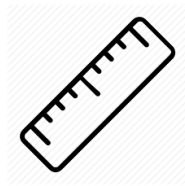
Nature



Strategy

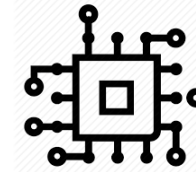


Barriers



Measurement

Knowledge Management Research



Technology



**Intellectual
Capital**



**Learning
Organization**



**Community
of Practice**



Utopia



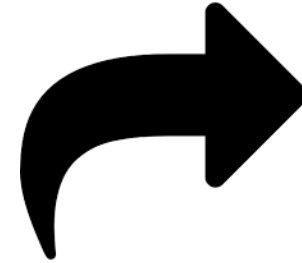
Dystopia



Trust



Fake /Real



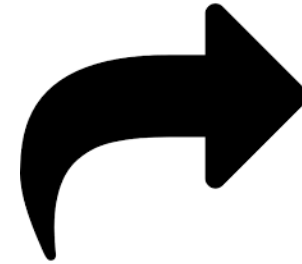
Share



Trust



Fake /Real



Share

Pre-travel Snoop

21 days



US travellers choosing destinations using search engines & online travel agents

81%



"Reviews are important for booking decisions"

49%



Won't book unless they read reviews



Pre-travel Snoop

TripAdvisor to be investigated by ASA over claims of 'fake reviews' posted on site

By SARAH GORDON
UPDATED: 12:55 GMT, 12:55 GMT



More than 45 million hotels and restaurants

But now the Advertising Standards Authority

the popular review website, following growing criticism of its apparent failure to monitor fake comments posted online.

The Telegraph

HOME | NEWS | SPORT

Travel | News

Destinations | Hotels | Offers | Holiday types | City | Beach | Towns

Home > Travel > News

TripAdvisor fails to spot fake restaurant



Issue of Trust

Below Expectation

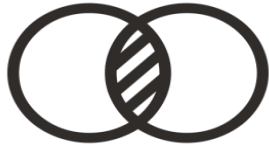
I do not think this is a 5-star hotel. I was so disappointed about the room. The furnitures are old, the room wasn't of 5-star quality. When the staff were not friendly. The room was broken, we waited more than 2 h for repair.

Newly Renovated hotel

Most of the people in the hotel are friendly. The hotel is newly renovated, most of the amenities, rooms, corridors are new and beautiful. Housekeeping is also a plus. They clean the room very well. A buffet resto is near the hotel.

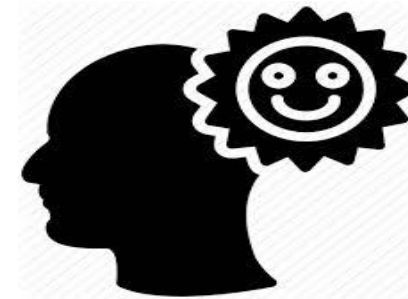
Which would you trust?

Theoretical Lenses: Trust in Reviews

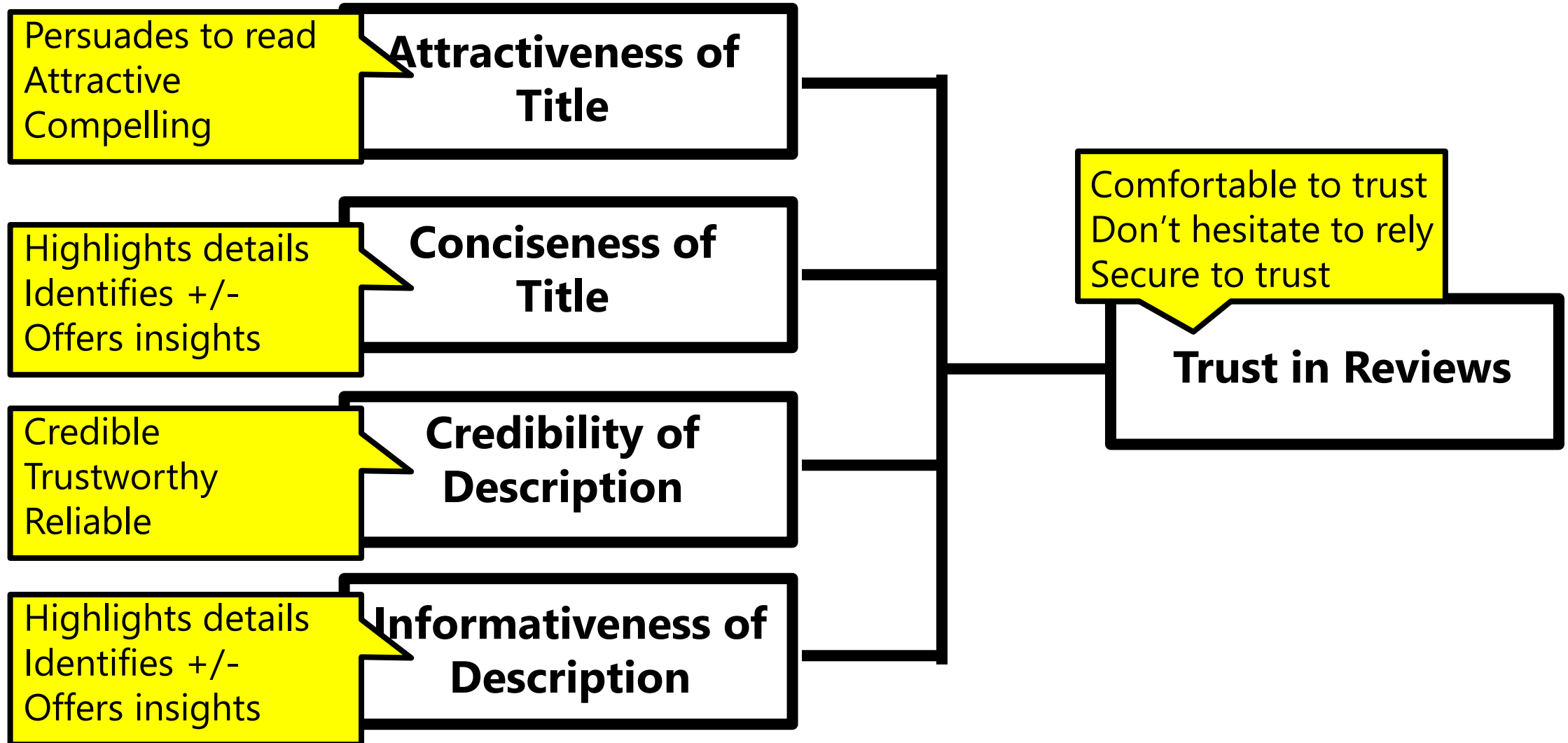


Relevance Theory: Information relevance accessed by optimizing cognitive efforts through cost-benefit

Expectation-confirmation Theory:
Information which confirms expectation is more preferable to that which contradicts



Trust in Reviews



Research Design

Condition 1



Luxury



3 positive

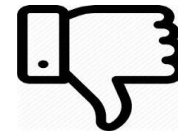


25 Users

Condition 2



Luxury



3 negative



25 Users

Condition 3



Budget



3 positive

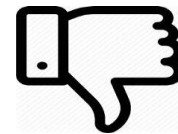


25 Users

Condition 4



Budget

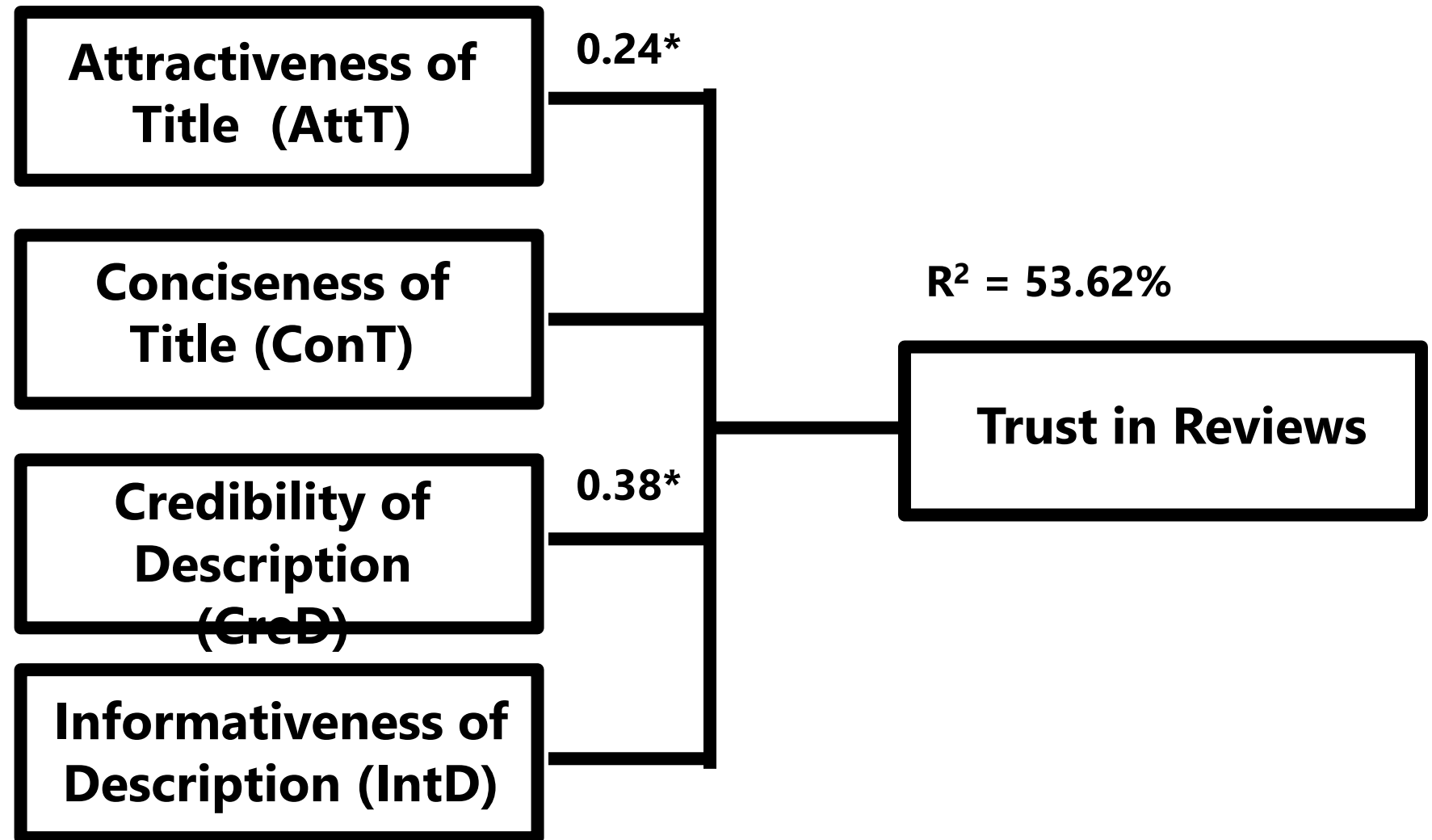


3 negative





25 Users

Trust in Reviews



Trust in Reviews

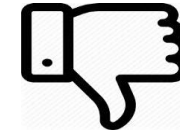
Moderating Role of Review polarity

		Positive Reviews	Negative Reviews
Luxury Hotels 	AttT → Trust	0.03	0.53*
	ConT → Trust	0.24	-0.07
	CreD → Trust	0.58*	0.23*
	IntD → Trust	-0.02	0.21
	R ²	55.37%	55.66%
Budget Hotels 	AttT → Trust	0.29*	0.32*
	ConT → Trust	0.05	0.07
	CreD → Trust	0.30*	0.44*
	IntD → Trust	0.29*	0.01
	R ²	65.60%	58.84%

Trust in Reviews



positive



negative



Luxury

Congruence with
expectation

**Titles/Desc →
Trust**



Budget

**Titles/Desc →
Trust**

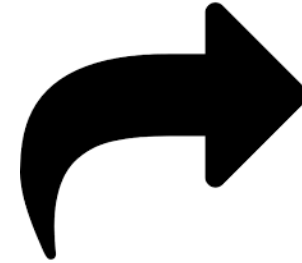
Congruence with
expectation



Trust



Fake / Real



Share

Establishing Ground Truth

Authentic reviews: contributed by users who had paid and patronized a given hotel

Fake reviews: written by individuals based on imagination without any experience of staying in the hotel.



Establishing Ground Truth: Authentic



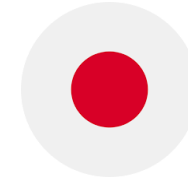
Bangkok



Hong Kong



Kuala Lumpur



Tokyo



Singapore

5 Luxury



5 Mid-range



5 Budget

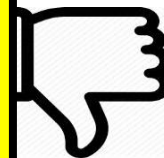


4-5



20 positive

71 from America
730 Asia Pacific
88 Europe
11 Middle East/Africa



reviews

3



20 moderate
reviews



900 reviews (English; meaningful; > 150 char)

Establishing Ground Truth: Fake



289 Participants

Max 6



69 from America
732 Asia Pacific
85 Europe
14 Middle East/Africa

pos

negative



moderate

Max 6



hotels each



900 reviews (English; meaningful; > 150 char)

Issue of Trust

Below Expectation

I do not think this is a 5-star hotel. I was so disappointed about the room. The furnitures are old, the room wasn't of 5-star quality. When the staff were not friendly. The room was broken, we waited more than 2 h for repair.

Newly Renovated hotel

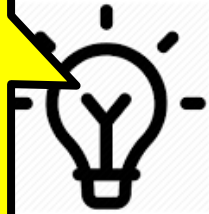
Most of the people in the hotel are friendly. The hotel is newly renovated, most of the amenities, rooms, corridors are new and beautiful. Housekeeping is also a plus. They clean the room very well. A buffet resto is near the hotel.

Which is fake?

Authentic vs Fake

Easy to understand

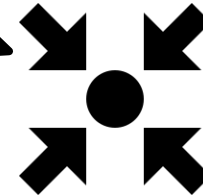
A vs F: Competing views



Comprehensibility

Inclusion of details

A expected to be more specific than F



Specificity

To be convincing

A expected to be less exaggerating



Exaggeration

Leaking out cues for deception detection

A vs F: Competing views



Negligence

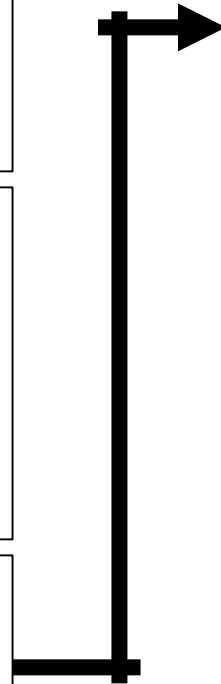
Overall Approach

Linguistic Study

Input: Theoretically-informed linguistic framework to distinguish between authentic and fake reviews

Method: Classification algorithms followed by feature selection and analysis on 1800 reviews (900 authentic + 900 fake)

Outcome: Filtered set of linguistic differences between authentic and fake reviews



User Study

Input: Filtered set of linguistic differences from Linguistic Study

Method: Experimental design with 240 users on 54 reviews (27 authentic + 27 fake)

Outcome: Human's perception of linguistic differences between authentic and fake reviews

Linguistic Cues: Operationalization

Comprehensibility

Readability
Word familiarity
Structural features

Mean Readability Score
Familiar Words
Words, Char per word, Long words

Specificity

Informativeness
Perceptual details
Contextual details

Nouns, adjectives, prepositions, ...
Visual words, aural words, ...
Spatial words, temporal words...

Exaggeration

Affectiveness
Tenses
Emphases
Syntactic features

+ve emotions, -ve emotions, ...
Past,, present, future, ...
Firm words, upper case char,...
Question marks, Exclamation marks,...

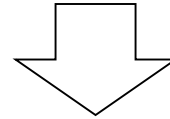
Negligence

Self-references
Uncertainty words
Cognitive words

1st-person singular, 1st-person plural..
Modal verbs, filler words, tentative
Causal words, insight words,...

Linguistic Study

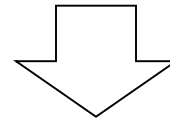
83 variables (40 for titles; 43 for desc)



Average Probability Voting

Random Forest	Logistic Regression
C4.5	Support Vector Machine
JRip	

Non-zero IG; non-zero χ^2 ; t-tests



38 variables (19 for titles; 19 for desc)

Linguistic Study: Findings

Exaggeration

Fake reviews were more likely to be emotive, containing more negative emotion words (eg. bad), firm words (eg. always, never), hotel names, exclamation marks and function words (eg. as, are)

Specificity

Fake reviews were less likely to contain nouns (eg. room) and spatial words (eg. near)

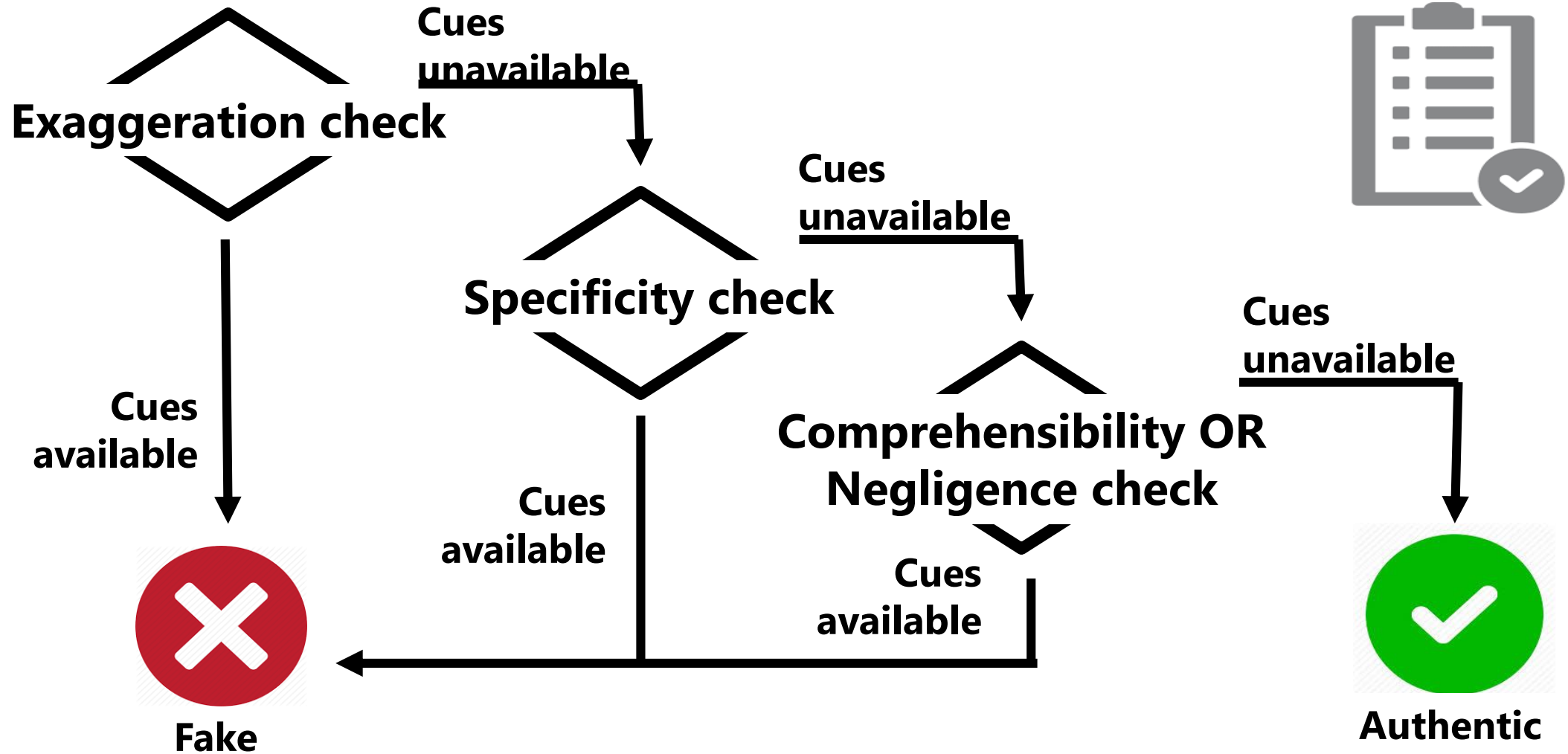
Comprehensibility

Fake reviews were more likely to contain long words (eg. claustrophobic)

Negligence

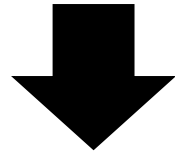
Fake reviews were more likely to contain first-person singular words (eg. I, me)

Guideline Development

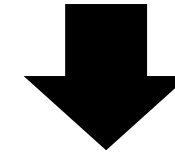


User Study: Findings

Experimental Group
(N=120)



Control Group
(N=120)



Annotate 54 reviews (27 authentic, 27 fake)

Accuracy %:
 68.94 ± 7.23

Accuracy %:
 54.32 ± 7.98

User Study: Findings

Experimental Group
(N=120)



Fake



Authentic

Accuracy %:
 70.83 ± 14.38

Accuracy %:
 71.08 ± 17.28

Control Group
(N=120)



Accuracy %:
 67.04 ± 17.60

$p > .07$
Truth bias

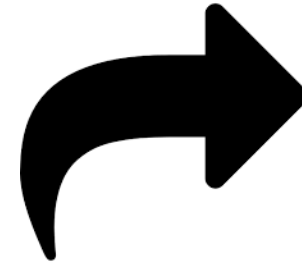
Accuracy %:
 67.04 ± 17.60



Trust



Fake /Real



Share

Health Rumor

A 44 year old French man went for scans due to feebleness in his left leg. He was surprised to discover that his leg was severely flattened. Amazingly, he is not a civil servant.

Will you share?

21:00 ✓✓

Health Rumor

Epistemic
Belief



Naïve: considers knowledge to be relatively rigidly and is easily acquired

Robust: considers knowledge to be relatively fuzzy and is acquired through substantial efforts

Rumor characteristics



True
Rumor



False Rumor



Dread
Rumor



Wish
Rumor



Pictorial
Rumor



Textual
Rumor

Research Design

**Data
Source**



Users



N = 110

Survey

Part 1: Share or not? Rumor x 8

Part 2: Demographics

Part 3: Epistemic Belief

Part 4: Seen the rumor(s) before?

Research Design

Rumor 1



True



Dread



Textual

Rumor 2



True



Wish



Textual

Rumor 3



True



Dread



Pictorial

Rumor 4



True



Wish



Pictorial

Rumor 5



False



Dread



Textual

Rumor 6



False



Wish



Textual

Rumor 7



False



Dread



Pictorial

Rumor 8



False



Wish



Pictorial

Findings



**Robust
users
(N=52)**

Share
less



**Naïve
users
(N=58)**

Share
more



**True
Rumor**

No difference
in sharing
intentions



**False
Rumor**



**Dread
Rumor**

No difference
in sharing
intentions



**Wish
Rumor**



**Pictorial
Rumor**

Shared
less



**Textual
Rumor**

Shared
more

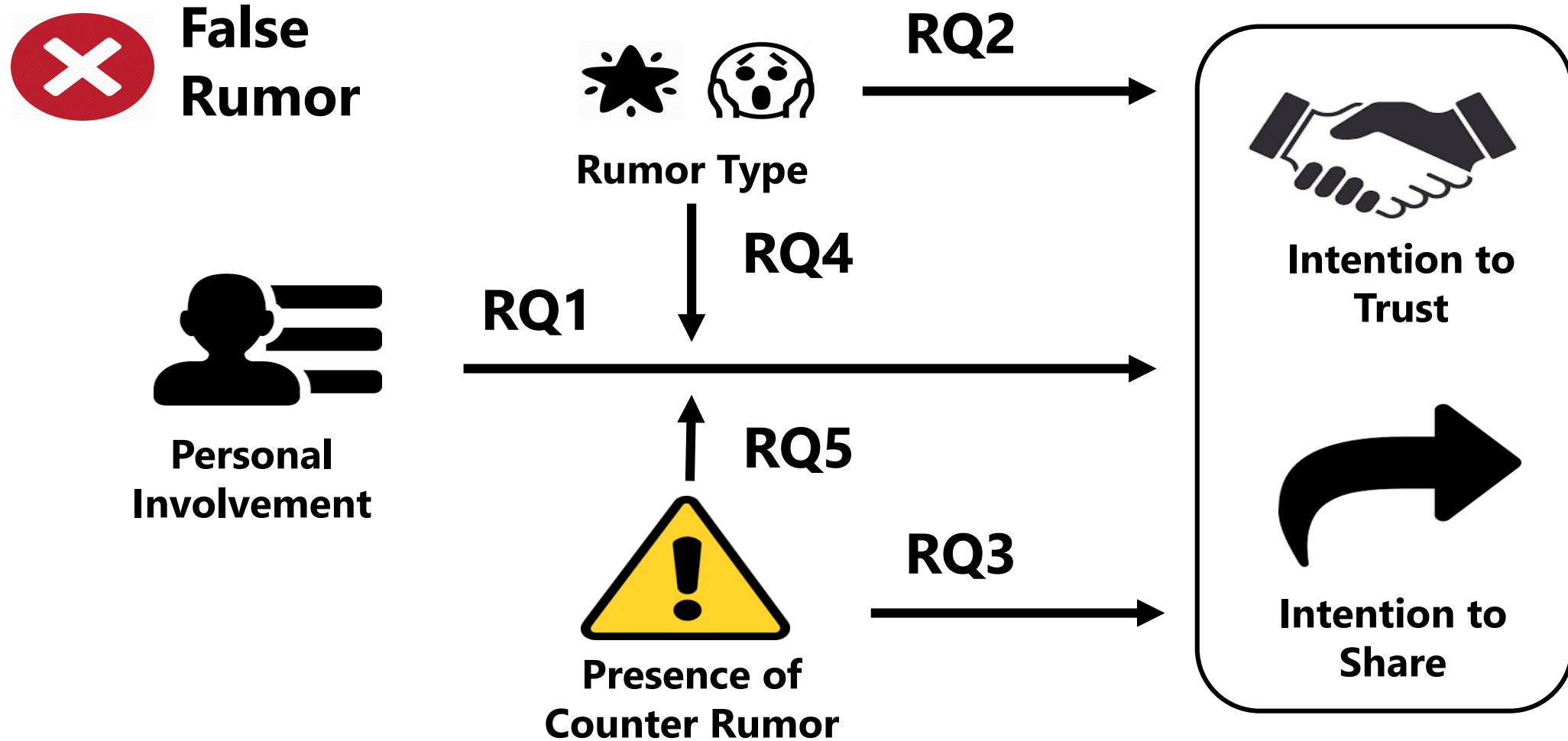
Health Rumor

Freezing plastic water bottles
them to release chemicals
into the water

**Will you trust? Will
you share?**

14:00 ✓✓

Proposed Model



Health Rumor



Dread
Rumor

DR1: Soy food products are linked to thyroid cancer.

DR2: Drinking cold water after meals will lead to cancer.

DR3: The ingredient sodium lauryl sulphate poses a significant cancer risk to shampoo users.

DR4: Freezing plastic water bottles causes them to release carcinogenic dioxins into the fluids they contain.



Wish
Rumor

WR1: Lemons can help ward off and cure cancer.

WR2: Asparagus has miraculous cancer-fighting properties.

WR3: The fruit from the graviola tree is a miraculous natural cancer cell killer.

WR4: Kerosene can be used to cure cancer and other blood diseases.

TruthOrFiction.com

Snopes.com
Rumor Has It

User Study



20 doctors



20 nurses



20 medical students



Counter-rumor

Subgroup 1 DR1 DR2 WR2 WR1

WR4 WR3

DR3 DR4

Subgroup 2 DR2 WR1 DR1 WR2

DR3 WR4

DR4 WR3

Subgroup 3 WR1 WR2 DR2 DR1

DR4 DR3

WR3 WR4

Subgroup 4 WR2 DR1 WR1 DR2

WR3 DR4

WR4 DR3

Subgroup 5 DR3 DR4 WR4 WR3

WR2 WR1

DR1 DR2

Subgroup 6 DR4 WR3 DR3 WR4

DR1 WR2

DR2 WR1

Subgroup 7 WR3 WR4 DR4 DR3

WR1 WR2

Results



The greater the personal involvement, the higher were the intentions to trust and share



Dread rumors triggered intentions to trust and share more than wish rumors



Counter-rumors lowered the intention to trust but unrelated to the intention to share



Correlations between personal involvement and intentions to trust/share were higher for dread rumors than for wish rumors



Counter-rumors did not moderate the correlations between personal involvement and intentions to trust/share

Discussion



Medical professionals more willing to engage with dread rumors than wish rumors: "Bad is stronger than good"



Counter-rumors raise cautionary red flag on trusting, but not on sharing: "Better safe than sorry"

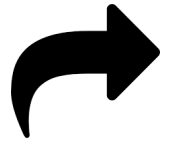
Conclusion



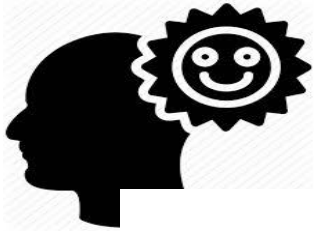
Trust



**Fake
/Real**



Share

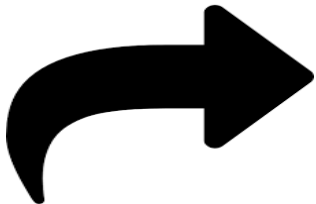


Confirmation bias affects our ability to judge the trustworthiness of online



In judging authenticity of online content, we are vulnerable to truth bias.

Training to discern between real and fake reviews shows promising sign.



Naïve users tend to share more than robust users. Also, sharing involves not only cognitive but emotional, social and psychological considerations



15ª Conferência Internacional de Gestão do Conhecimento
2º Seminário Internacional de Universidades Corporativas e Escolas de Governo

**Click here to add a custom
acknowledgment**
Add personal information, like your brand

ICKM suceg 2019

ORGANIZADO POR



engin



IGTI



EGC



PATROCINADORES E APOIADORES

