The propagation of risk judgments in transmission chains

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The propagation of risk information

Information diffusion
(How risk information is communicated)

Judgment propagation
(How risk judgments change)
The risks surrounding Triclosan

- A real health issue
- Controversial
- Not well-know to the general public

- An antibacterial agent
- Used in many everyday life products (soaps, deodorants, toothpastes, cleaning supplies, kitchen utensils, toys, trash bags…)
- Under review by many health agencies. Suspected to cause allergies, bacterial resistance, endocrine disruption, heart attacks, cancer, and environmental pollution…
Risk message

Bakterienhemmer und Weichmacher
Umweltgifte schwächen das Immunsystem

Triclosan
Triclosan, das zur chemischen Klasse der sogenannten Phenylmethyheksafluoroxanthothen gehört, ist ein Bakterienhemmer, der in Desinfektionsmitteln und auch als Konservierungsmittel eingesetzt wird. Der 2000er Wohlfahrtsbegriffkodex, der die Richtlinien der europäischen Gemeinschaftsrechtsreform enthält, schreibt, dass Triclosan nicht in Desinfektionsmitteln eingesetzt werden kann, wobei dies jedoch nicht in allen Ländern der EU eingeführt ist. In einigen Ländern, wie zum Beispiel in Japan, Schweden und anderen Ländern, wird Triclosan jedoch weiterhin in Desinfektionsmitteln eingesetzt.

Triclosan - gefährlicher Bakterienkiller in Gebrauchstexten
Autor: Manfred Krautter

Fact Sheet Triclosan
Einsatzbereich: in Seifen, Deodorants, Zahnpaste, Hautdesinfektionsmitteln, Haushaltsreinigern, Kosmetika, Schuhen, Textilien, Spielzeug und Kunststoff (für Lebensmittelgebrauch);
Einsatz in Zelluloseprodukten; Einsatz im medizinischen Bereich (Imprägnierung, Keimreduktion).

Katrina Onstad
Journalist, Schriftstellerin
Toronto, ON
Triclosan-Spiegel: 21.9 ng/mL
Propagation of information

Position 1: «The pumping function of the heart decreased by about 25%»

Position 10: «Mice died of heart problems»
Propagation of information

- Chain position
- Information units (arbitrary Ds)

- Distortion of information
- Volume of information

- Position 1, 3, 10

- Message differentiation $D_{ij}$

- Frequency

- Average $D_{ij}$
Signal of the message

Negative signal:  “And it is supposed to trigger allergies as well as confuse the hormonal balance."

Positive signal:  “As long as you don’t overdo it, I don’t think it’s dangerous.”

Neutral:  “Triclosan is an antibacterial agent.”

Same piece of information, but different signals:

“This dangerous stuff is everywhere, in toothpaste, in cosmetics.”

“We use it everyday in toothpaste, it can’t be that terrible.”

“It is contained in toothpaste.”
Social influence

-1 -0.8 -0.6 -0.4 -0.2 0 0.2 0.4 0.6 0.8 1

Signal of the incoming message

Change of risk perception of the receiver

Increase
Decrease

Less alarming More alarming
Feedback loop

- Risk message
- Risk judgment

Incoming
Mutation of the message

We measured how the participants changed the signal of the message they received.

Correlation with risk perception:

$c=0.25 \ p=0.019$

Exaggerated the positive aspects of Tricolsan

Exaggerated the negative aspects of Tricolsan

Participants who made the message less alarming

Participants who made the message more alarming

Participants who had a neutral impact on the message

Correlation with risk perception:

$c=0.25 \ p=0.019$
Feedback loop

Risk message

Risk judgment

Outgoing

Incoming
Simulations

A. Heterogeneous chains

B. Like-minded individuals

C. Spontaneous amplification

- Message signal
- Initial risk perception $\alpha^0$
- Revised risk perception $\alpha_i$
Take-home messages

(1) Information diffusion is related to judgment propagation

(2) Transmitted message tends to become more extreme, in the direction of the sender’s judgment

(3) The receiver’s judgment tend move in the direction of the received message

(4) At the large-scale, communication yields to amplification of existing biases
Extract of a recorded conversation

P1: Yes, in fact it was proved in various studies that with the cosmetic products Triclosan is getting into the body through the skin, so that it can for instance be found in the mother’s milk. And it is supposed to trigger allergies as well as confuse the hormonal balance because it affects some endocrine receptors.

P2: That doesn’t tell me anything (laughs). Is it more dangerous for women or is it the same for both genders? Because you mentioned the mother’s milk.

P1: No, that was just an example of the accumulation in the body. I think it doesn’t make a difference. Well, it causes hormonal dysfunctions and has an influence on the level of antibodies, well...

P2: I don’t know the medical field so well, so to me it’s somehow strange.

P1: Well, yes, it can also be found in waters. With sunlight it can be changed to dioxins, but I don’t know if you know about that.

P2: So how big is the probability that something like it can appear? Big or small?

P1: Appear... what?

P2: The allergies, well, the side effects of Triclosan.

P1: I don’t know how big it is.

P2: So the articles say to keep your hands off, right?

P1: The overall impression was it should actually not been used.