Social-cognitive predictors for hearing aid use

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sivantos the hearing company

Motivation

Over the past years there have been many improvements for hearing aids (HA)

➤ Wearing comfort and size

➤ Hearing aid technology, e.g.

– Feedback cancelation

– Noise reduction

– Speech enhancement

However, there is still:

➤ a big gap between the indication of HA use and the actual fitting rate.

– More than 1/3 of people above 65 would benefit from wearing HAs, but only 11% own them (e.g. Lopez-Torres Hidalgo et al., 2009).

➤ a low level of hearing aid use.

– 15% use their hearing instruments less than 1 hour / day.

– 24% do not use their hearing instruments at all (e.g. Hartley et al., 2010).

⇒ **Which factors influence the use of hearing instruments?**

Methods

➤ **Theoretical framework: Health Action Process Approach** (HAPA; Schwarzer, 1992)

– Interpretation of hearing aid use as one aspect of health behaviour and application of the theoretical framework of HAPA

– Hypotheses:

1. Positive relation between self-efficacy and hearing aid use
2. No direct relation between outcome expectancies and hearing aid use
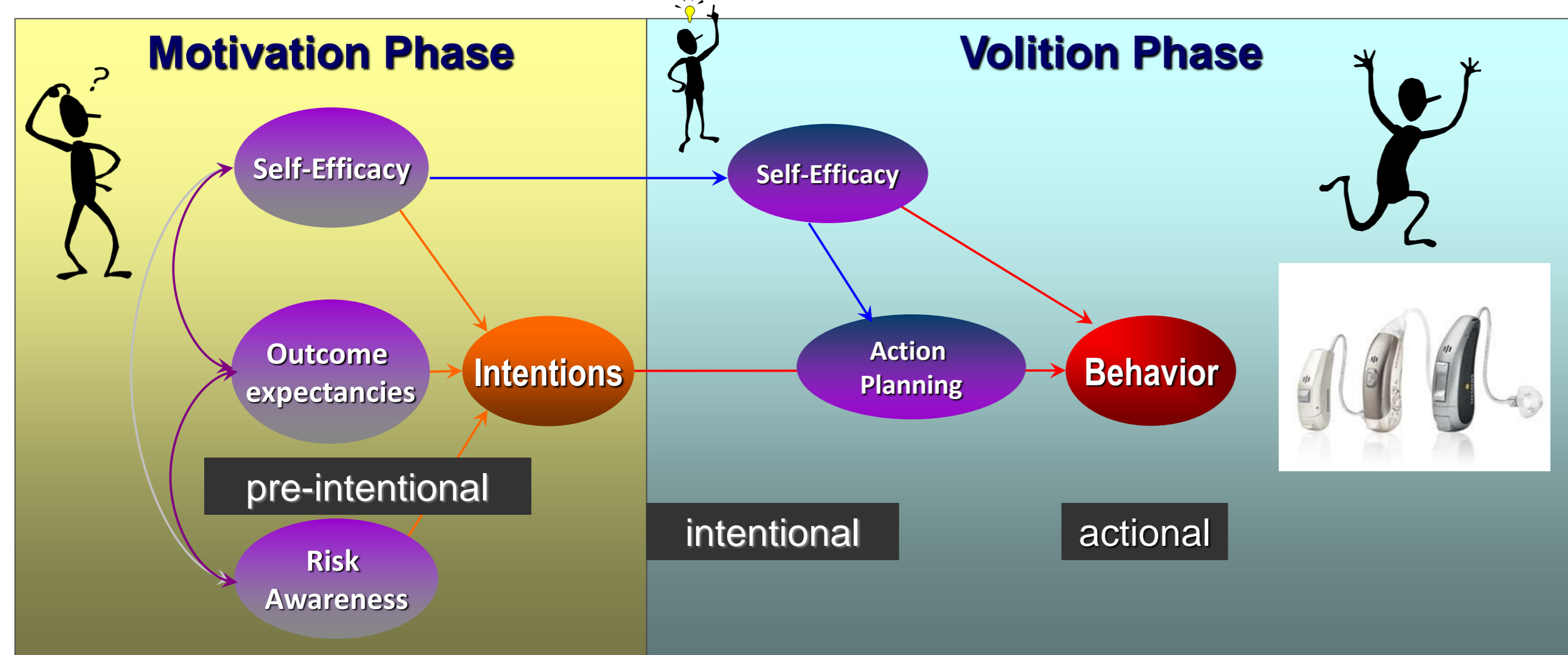

Fig 1: Health Action Process Approach: A 2-Layer Model (Schwarzer, 1992). [http://userpage.fu-berlin.de/health/hapa.htm]

➤ **Measures**

▪ Collection of self-reported data during a fitting study for Sivantos GmbH

▪ **Social-cognitive predictors**

– Self-efficacy

– Motivational: „I am sure that I will try to use my hearing aids in a variety of situations."

– Volitional: „I am sure that I will continue to wear my hearing aids regularly, even if I do not immediately notice any positive changes."

– Outcome expectancies

– Positive: „Wearing my hearing aids will make me more resilient throughout daily life."

– Negative: „Wearing my hearing aids every day will require great willpower."

▪ **Hearing aid use**

– Daily usage time (% of awake time)

– Usage habits (frequency and variety for nine different daily-life situations, e.g. telephone chat, leisure time, etc. as reported in Williger & Lang, 2015)

▪ **Control variables:** age, gender, hearing loss, hearing aid experience

➤ **Participants**

– 30 experienced hearing aid users (age 53 - 91 years, $M = 76.83$, $SD = 8.77$, 63% male)

– Bilateral sloping sensorineural hearing loss ($M = 52.90$ dB HL; $SD = 6.65$)

Results

➤ **Descriptive statistics**

Tab 1: Descriptive statistics for the social-cognitive predictors and the hearing aid usage.

Variable	*M*	*SD*	Range *Min*	*Max*
SE	3.44	0.83	1.00	4.00
OE	3.63	0.80	1.00	4.00
FU	4.34	0.95	1.78	5.00
DV	8.23	1.61	4.00	9.00
WT in %	78	26	10	100

Note:
SE: Self-efficacy
OE = Outcome expectancies
Scale:1 = not to 4 = completely agree
FU = frequency of usage
Scale: 1= never to 5 = always
DV = Diversity of situations
Scale 0 = no to 9 use in all situations
WT = daily wearing time

➤ **Relations among social-cognitive variables and hearing aid usage**

– High positive correlation between outcome expectancies and wearing time, diversity and frequency of hearing aid use [$r(28) = .61$ to $.74$; $p ≤ .01$]

– Weak positive correlation between self-efficacy and hearing aid use [$r(28) = .30$ to $.35$; $p ≤ .10$]

– Moderate positive correlation between HA experience and diversity of HA use [$r(28) = .38$; $p ≤ .05$]

➤ **Prediction of hearing aid usage from social-cognitive variables**

– Multiple hierarchical regression analysis

– 1st step: self-efficacy and outcome expectancies

– 2nd step control variables: age, PTA, HA experience and gender

Prediction of wearing time

■ OE ■ Control variables ■ not explained

Fig 2: Illustration of the predictive value (R^2corr) of self-efficacy, outcome expectancies and control variables (age, PTA, HA experience, gender) for variances in wearing time.

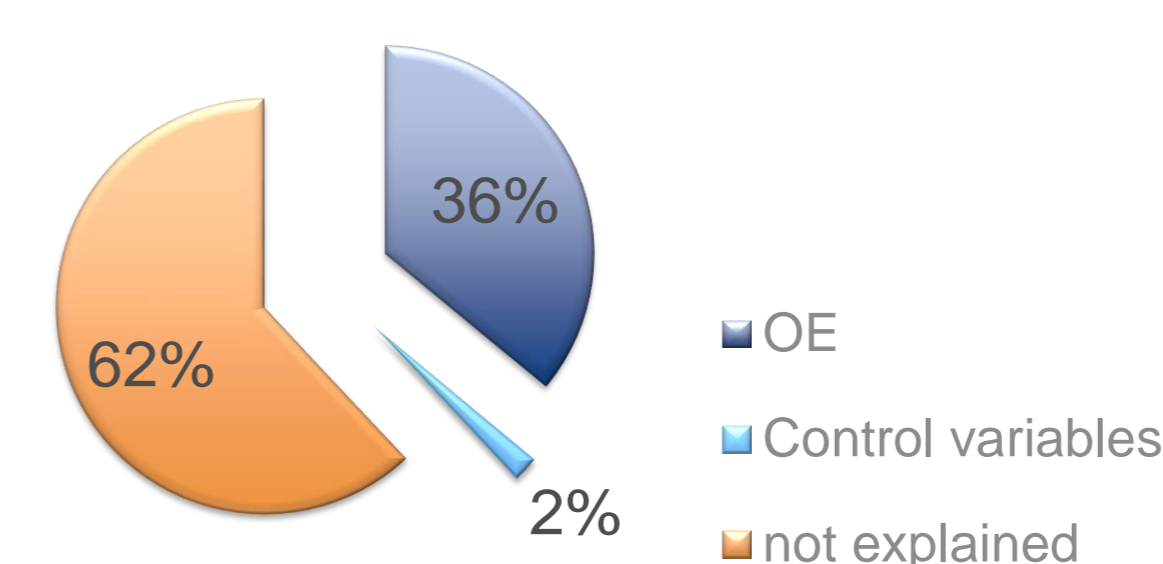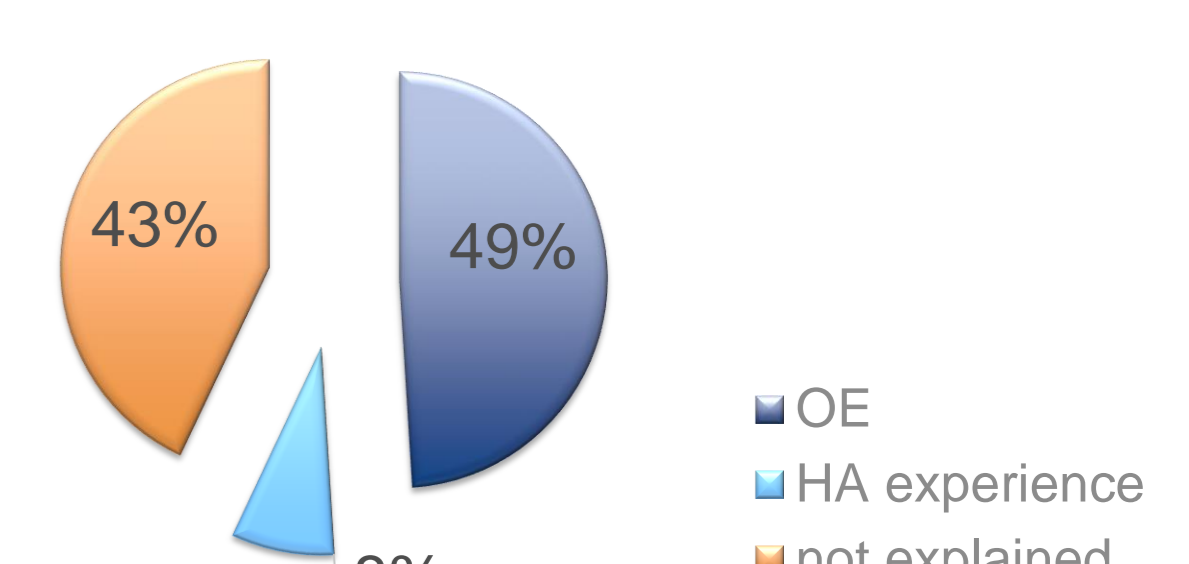**Prediction of diversity**

■ OE ■ HA experience ■ not explained

Fig 3: Illustration of the predictive value (R^2corr) of self-efficacy, outcome expectancies and control variables (age, PTA, HA experience, gender) for variances in diversity of wearing situations.

– OE significantly predicts wearing time ($\beta = .57$, $t(27) = 3.72$, $p = .001$)

– OE explains substantial variance ($R^2 = .40$, $F(2,27) = 8.99$, $p = .001$)

– Control variables did not contribute to the prediction accuracy

– OE significantly predicts diversity of hearing aid use ($\beta = .65$, $t(27) = 4.77$, $p < .001$)

– OE explains substantial variance ($R^2 = .53$, $F(2,27) = 14.89$, $p < .001$)

– HA experience significantly predicts diversity ($\beta = .37$, $t(23) = 2.65$, $p = .01$)

Frequency of hearing aid use

– OE is a significant predictor ($\beta = .70$, $t(27) = 5.32$, $p < .001$) and explains substantial variance ($R^2 = .56$, $F(2,27) = 17.13$, $p < .001$)

– Control variables did not contribute to the prediction accuracy

Conclusions

Influence of social-cognitive predictors on hearing aid use

➤ Self-efficacy has only a weak predictive value.

➤ However, people with positive outcome expectancies use their hearing aids longer, more frequently and in more hearing situations.

Possible explanations

➤ Positive selection with respect to self-efficacy (see descriptive statistics).

➤ Self-efficacy and outcome expectancies of experienced HA users might be influenced by their current behaviour.

Outlook

➤ Longitudinal study was conducted with novice HA users (ongoing analyses).

➤ Scope: Do social-cognitive factors predict preferred gain level for first fit and influence the acclimatisation process?

➤ If future research confirms the importance of social-cognitive variables, the acoustician should consider these variables in the fitting process.

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