

# Psychometric analysis of a questionnaire measuring goals associated with health information seeking (GAINS)

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The structure of this protocol is based on the template of the OSF's preregistration challenge (<https://cos.io/prereg/>).

## Study Information

### Introduction

The 16 item-GAINS questionnaire<sup>1</sup> aims at measuring individual goals of health information seeking on the four scales 'Understanding', 'Action Planning', 'Hope' and 'Reassurance', as well as measuring a general need for health information, computed as the mean score across the scales. In health contexts, goal-oriented information seeking may be interpreted as a way of coping with situations that are perceived as threatening (Lambert & Loiselle, 2007; Shiloh & Orgler-Shoob, 2006). Thus, the four scales represent four different goal types. The four goals can be differentiated by means of problem- vs. emotion oriented focus and promotion vs. prevention oriented focus. The distinction between problem- and emotion-focused coping is well-established (Littelton, Horsley, John & Nelson, 2007) and was initially proposed by Folkman and Lazarus (1980). Accordingly, a problem-focus is characterized by aiming at tackling and eliminating the problem itself, e.g. by understanding its causes and making plans of action. In contrast, emotion-focused strategies primarily seek to improve emotional wellbeing, e.g., reduce distress caused by the problem. However, to fully cover the goals individuals pursue when confronted with the respective problem further differentiation is required. Strauman (1996) was able to predict goals as well as strategies to pursue them, by the differentiation of two regulatory foci, promotion focus and prevention focus, which were initially postulated by Higgins (1987) in the regulatory focus theory. Integrating these two superordinate categorizations of goals associated with health information seeking into one common framework results in a 2 x 2 matrix containing the four goal types covered by the questionnaire (see Figure 1).

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<sup>1</sup> The items and a short description of the questionnaire are provided online: <https://www.psyndex.de/retrieval/PSYINDEXTests.php?id=9007528>

As the questionnaire has already been validated in two large student samples using fictional health problem scenarios, the aim of this study is to determine if the instrument may also be applied in the general population to persons who have a real health problem and a resulting information need.

		Coping Focus	
		Problem	Emotion
Regulatory Focus	Promotion	Understanding	Hope
	Prevention	Action planning	Reassurance

Figure 1. 2x2 Matrix of health information seeking goals.

## Research Questions

First, our aim is to analyse basic item characteristics (difficulty, variance, and discriminatory power) as well as the internal consistency of the scales (Cronbach’s Alpha). Second, we aim to replicate the proposed factor structure of the GAINS-questionnaire in a relevant sample and therefore validate its structure. According to our theoretical assumptions from the initial validation, we expect a confirmatory factor model with five latent variables (four first order-factors representing the four goals measured by the GAINS and one second-order factor representing a general need for health information) to yield a good fit (see Figure 2). We will also examine nomological relationships of the GAINS scales with relevant constructs to analyze construct validity.

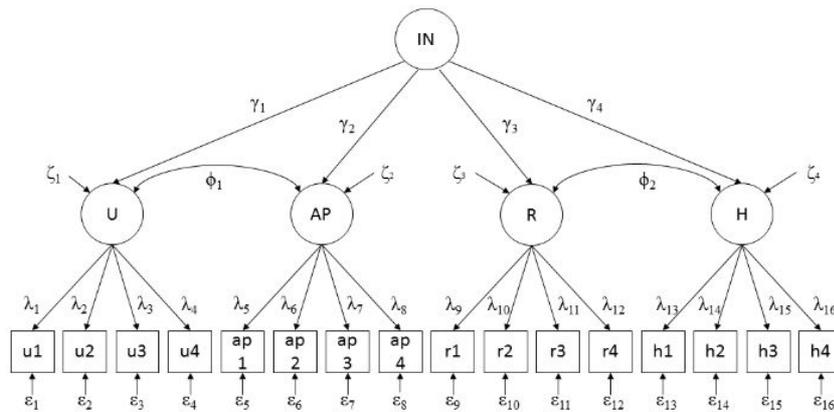


Figure 2. Proposed factor model of the GAINS questionnaire, as applied to Model 1a in the first sample and Model 1b in the second sample. IN = Information Need. U = Understanding. AP = Action Planning. R = Reassurance. H = Hope.  $\gamma$  = Path-coefficients of latent factors (fixed to being equal).  $\zeta_x$  = Variance of endogen latent factors.  $\phi_x$  = Covariance of latent factors.  $\lambda_x$  = Path coefficients of manifest variables.  $\epsilon_x$  = Error of manifest variables.

## Hypotheses

- 1) Item characteristics of every single item are satisfactory (item variance and discriminatory power > .30).
- 2) All scales have a satisfactory internal consistency (Cronbach's Alpha > .70).
- 3) The theoretically proposed and factor structure of the GAINS, which has already been empirically validated in two student samples, can be replicated in a sample more relevant for the scope of the questionnaire, i.e., a general population sample with a health problem and a resulting information need (factorial validity).
- 4) The nomological relationships between the GAINS scales and relevant constructs which have been identified in previous studies in two large student samples using fictional health problem scenarios, can also be found in a large population sample with real health problems (construct validity). Specifically, a general need for information measured with a single item as well as a different instrument measuring thoroughness of information seeking will positively predict the GAINS general score measuring a general information need. We also expect perceived health literacy to positively predict the problem focus scale values. Furthermore, dispositional approach and avoidance motivation should positively predict promotion and prevention focus scale values, respectively.

# Sampling Plan

## Existing Data

registration prior to creation of data

## Explanation of existing data

not applicable

## Data collection procedures

Participants will be recruited through a panel, administered by a professional agency. Only German speaking participants aged 18-70 with current or recently experienced health issues and a present information need concerning the health problem will be considered. To warrant this, a filter question will be presented prior to the questionnaire. Data collection will be performed online using the survey software Unipark. Participants can complete the data collection independently using their own device.

## Sample size

According to rules of thumb for adequate sample sizes in confirmatory factor analysis, our target sample should have at least 500 adults with a relevant experiential background, as illustrated above.

## Sample size rationale

Sample size rationale is based on theoretical assumptions and guiding principles for Structural Equation Modeling (see for example Byrne, 2012).

## Stopping rule

Recruitment should be stopped if a minimum of 500 participants have completed the survey. If the planned sample size cannot be achieved due to practical reasons, the study will be carried out with a reduced sample size.

# Variables

## Manipulated variables

not applicable - no experimental design

## Measured variables

Sociodemographic data (age, gender, marital status, nationality, educational background), the GAINS-questionnaire with its 4 scales "Understanding", "Action Planning", "Reassurance" and "Hope", information need (single item), perceived threat (single item), perceived knowledge about the health

problem (single item), duration of health problem, diagnosis (if applicable), thoroughness of information seeking (TOS-scale; Heinström, 2002), perceived health information literacy (SES-IB by Behm, 2015, adapted to a health context), dispositional approach and avoidance motivation (ARES-K; Hartig & Moosbrugger, 2003)

## Indices

During the estimation of the structural equation model, the manifest items of the questionnaire are combined into 4 first-order latent factors (or scales, see above), which are also combined in one second-order factor, representing the general information need.

## Design Plan

### Blinding

not applicable

### Study design

cross-sectional survey

### Randomization

not applicable

### Study duration

approximately 25 minutes

## Analysis Plan

### Statistical models

We will use structural equation modeling (SEM) using the R package lavaan (Rosseel, 2012) to perform a confirmatory factor analysis. Multiple regression analysis will be performed to analyze the proposed nomological relationships between the GAINS scales and relevant constructs.

### Transformations

not applicable

### Inference criteria

not applicable

## Data exclusion

Multivariate outliers will be excluded based on mahalanobis distance. If outlier-corrected analyses are performed, results of analyses including these outliers will also be reported. Participants may be excluded from analyses if major protocol deviations occur (e.g., if they produce more than 50% of missing data).

## Missing data

Full information maximum likelihood estimation, as provided by the lavaan package, will be used if the missing mechanism can be regarded as missing at random or missing completely at random.

## Exploratory analysis

not applicable

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