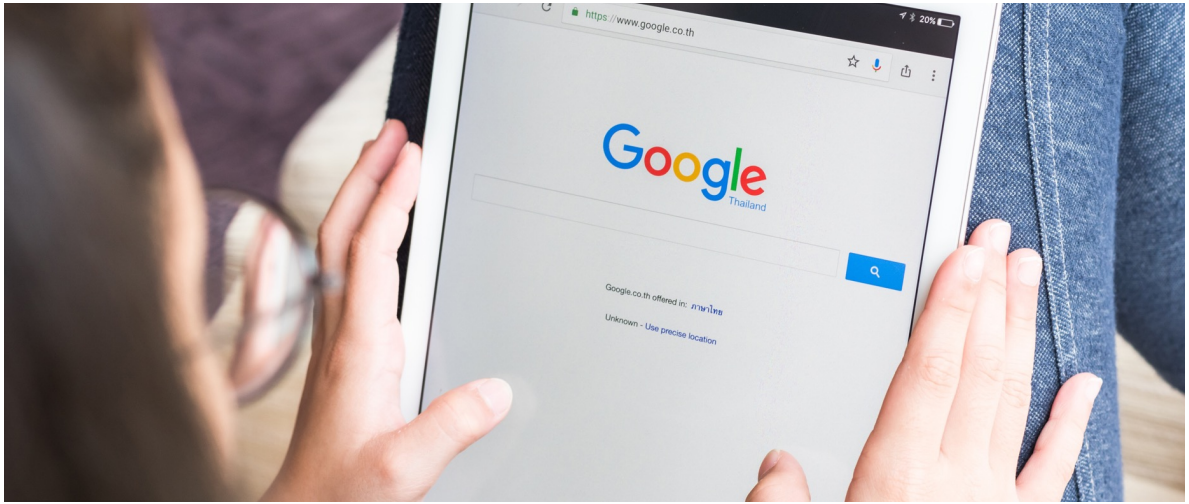
LOIS – Predicting search satisfaction and success



Why are some people successfull searchers and others not?

Miraculous pills – buy online!

Watch your calory intake– here's how

Research Questions

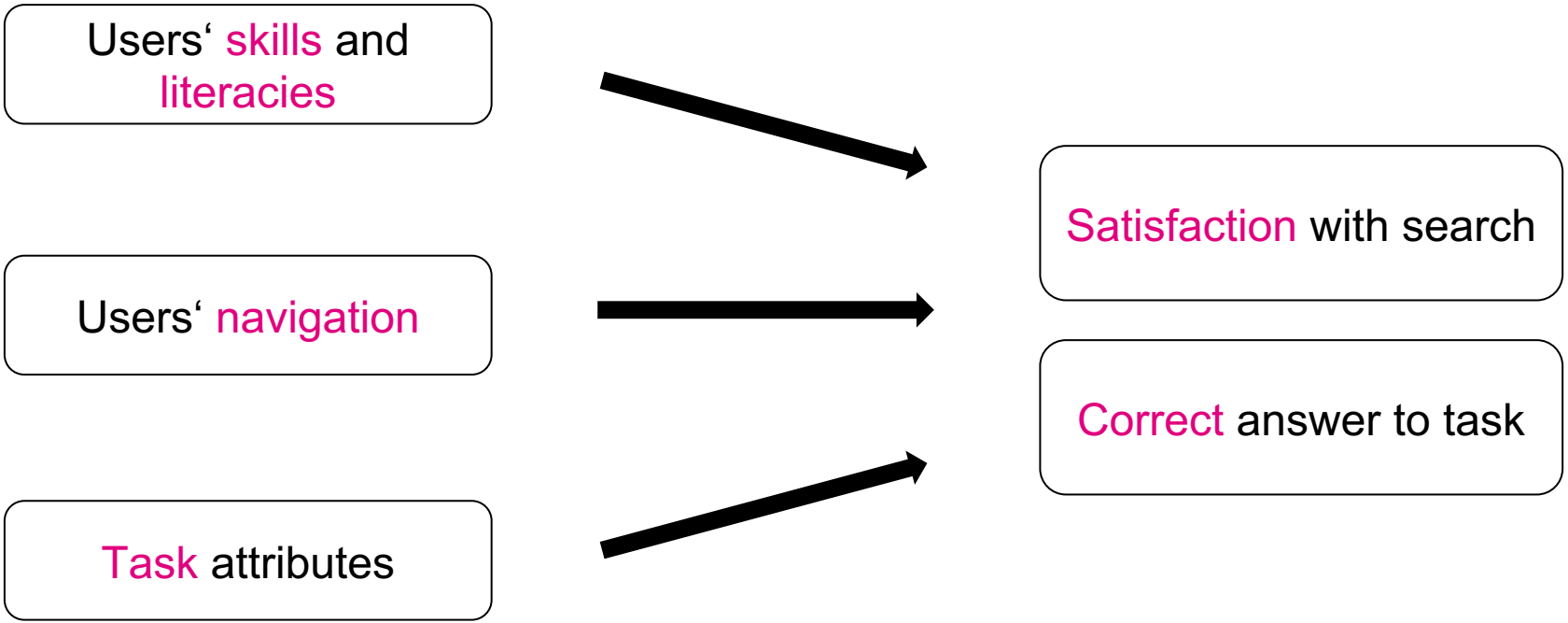
RQ1: What factors influence search task satisfaction?

What does this mean for task design?

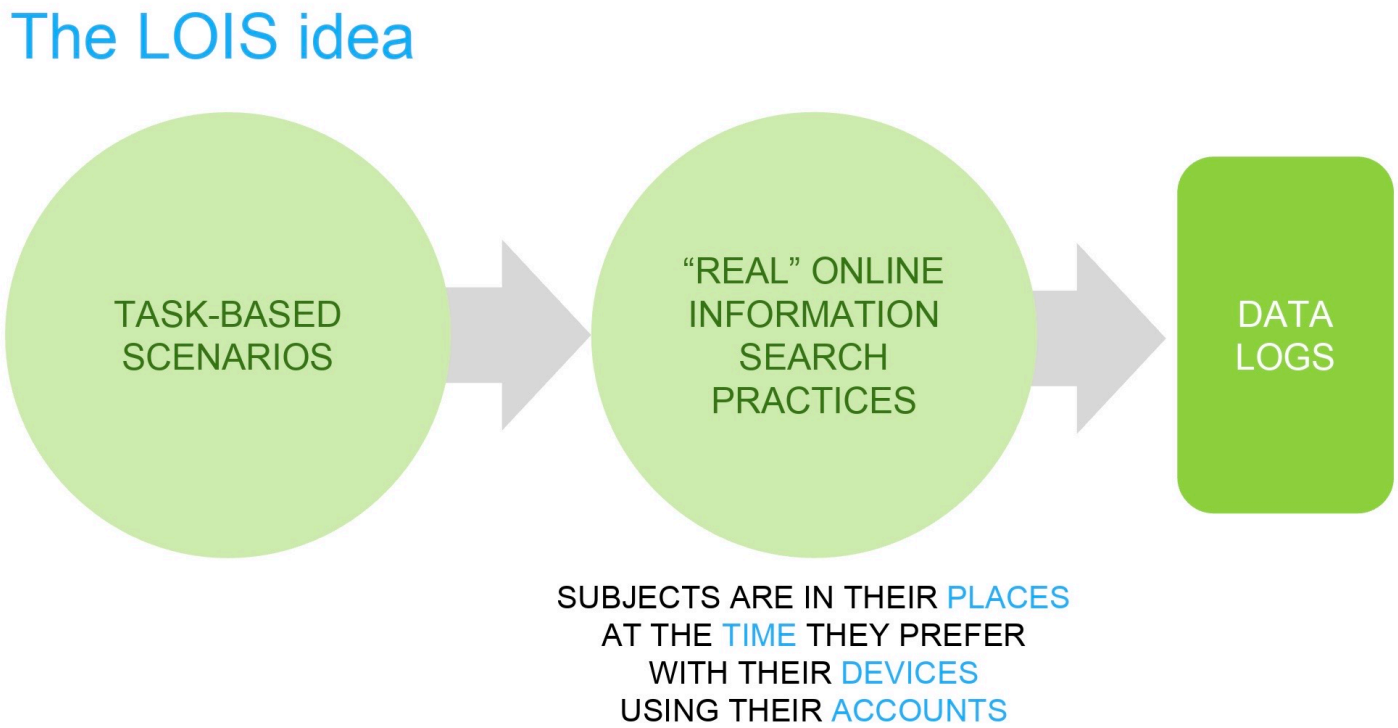
RQ2: What factors influence search task success?

What does this mean for understanding information search?

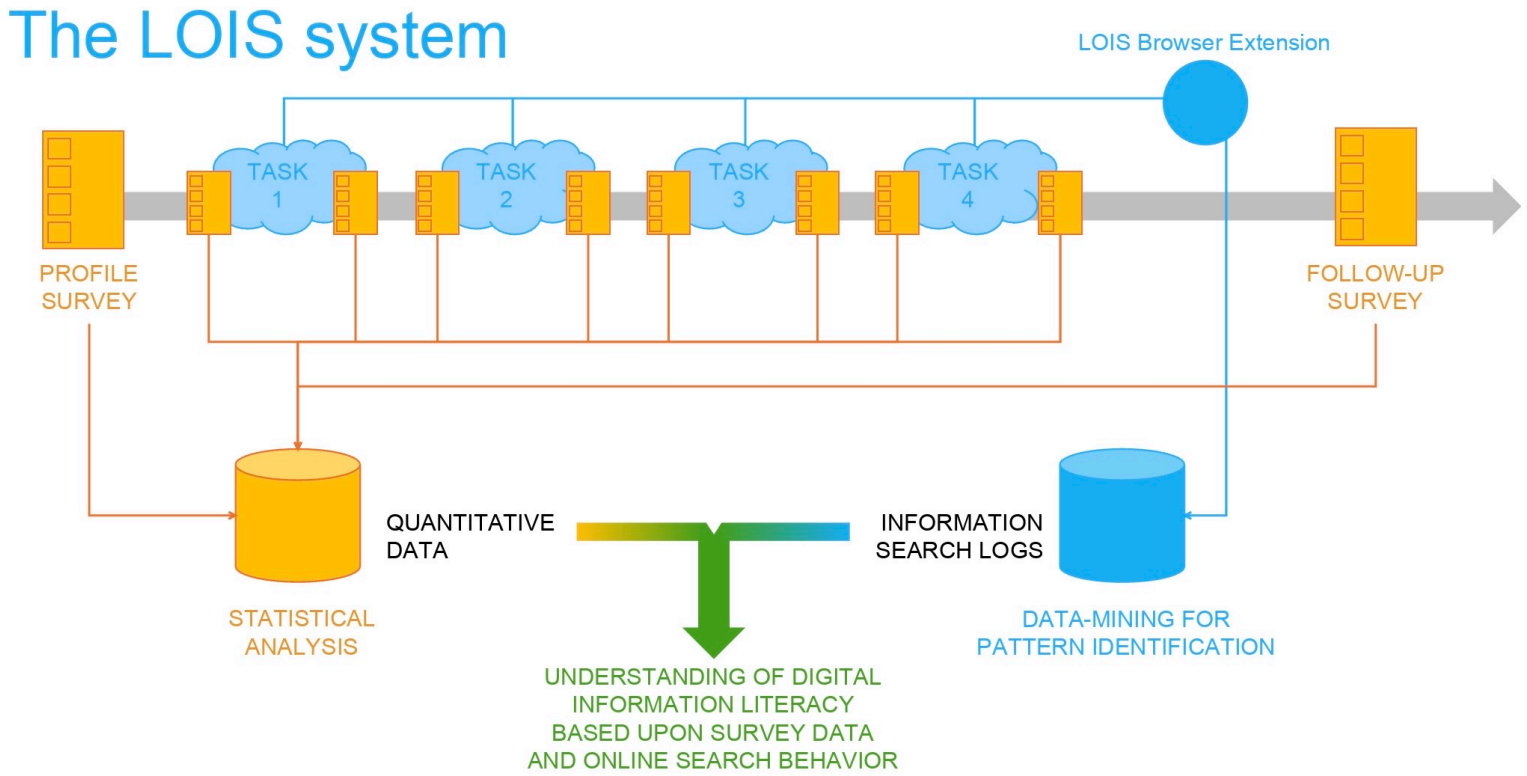
Possible predictors



LOIS System Slide 1



LOIS System Slide 2



Sample

152 Participants (removed some outliers based on duration)

Gender = 49% male

Age = 19,05 years

Scale Digital Skills (α = 0.84), unidimensional

I can …

… collaborate with other people at distance

… ignore messages that pop up (for example, friends' statuses) while doing something important

… solve my own technical problems, also searching online

… learn to use new technologies easily

… Protect digital equipment from undesired access online

… Manage and delete my digital traces

… Detect when someone is trying to trick me into sharing personal information

… Identify dangerous websites (for example, that can be used for fraud, viruses, etc.)

… Use more digital tools in order to create digital content (presentations, videos, audios, etc.)

… Choose a suitable creative commons license for material I have created

… Identify when and how programming/coding can be used in different subject areas to make things better/easier

… Adapt and adjust the behavior and functionality of a program or app through its settings

N = 152

Scale Information Literacy Self-Efficacy (α = 0.74), unidimensional

When searching for information of any kind I feel confident and competent to...

… define what specific information I'm looking for*
… select the information that answers my question best*
… use different kinds of non-digital sources, like books, encyclopedias, magazines*
… use different kinds of digital sources like websites, wikipedia and social networks***
… find the best words to type into a search bar (e.g. Google, library catalogue, video search etc.)***
… narrow results down (e.g. by sorting, by defining a time range etc.)***
… combine information from different sources to answer my question(s)*
… assess my information seeking process and its result*
… determine whether the information comes from a trustworthy source**

N = 152

Scale Information Assessment, two dimensional

Imagine you have to make a very important decision you‘re not sure about. Therefore you go and search for information online. How do you evaluate it?

Factor 1: Superficial evaluation of information (**α = 0.72**)	*Loadings*
The text on the website is long	0.75
The website has images and/or videos	0.71
The website is well designed	0.70
The website has commercial purposes	0.65
If the page was on the top of my search results*	0.60
Factor 2: Deep evaluation of information (**α = 0.49**)	
The website has references to other sources (e.g. websites, books etc.)	0.65
You have found trustworthy information on this website before	0.64
The author of the post or page has a good reputation	0.63
info on the website fits with what you already know	0.56

N = 152

Tasks given to participants

Task 1 

Your friend wants to start eating vegan, despite being only 14 years old and having asthma. What would you advise her? Is going vegan safe?

Task 2 

Your friend has been invited to eating Pesto. But he has heard basil can be poisonous and needs advice whether to go to the dinner or not.

Task 3 

Your friend has heard that climate change will facilitate the spread of tropical diseases and wants to move further north. What would you advise her to do; stay or move?

Tasks

	Diet Task (N=121)	Pesto Task (N=133)	Climate Task (N=129)
Fully correct (=2)	31% (37)	**71%** (94)	23% (30)
Partially correct (=1)	50% (61)	16% (21)	30% (38)
Wrong (=0)	19% (23)	9% (12)	**40%** (51)
Incoherent answers	0	4% (6)	7% (9)
Time spent on task (min.)	**7.9***	5.5	6.1
Task knowledge (pre task, 1-5)	2.54 (1.09)	2.20 (1.36)	1.98 (1.11) (N = 126)
Task importance (1-5)	4.7	4.2	4.0
Task difficulty (post task, 1-5)	**2.11***	**2.33***	**2.94***

Fully correct = correct answer ; partially correct = generic correct answer; wrong = wrong answer

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Research Questions

RQ1: What factors influence search task satisfaction?

What does this mean for task design?

RQ2: What factors influence search task success?

What does this mean for understanding information search?

How satisfied are you with the search? (1-5)

	Predicting Satisfaction (N=364)		
	Odds Ratio	CI	p
Intercept	-16.44	-96.89 – 64.00	0.688
Duration to finish task	**0.42**	0.20 – 0.64	**<0.001**
Number of Search Actions	-0.02	-0.07 – 0.04	0.548
Number of Result Actions	-0.01	-0.04 – 0.02	0.401
Number of Queries	-0.01	-0.07 – 0.05	0.756
Number of Query Revisions	-0.00	-0.10 – 0.09	0.931
Importance of task	**0.12**	0.02 – 0.21	**0.017**
Prior Knowledge on topic	0.06	-0.02 – 0.14	0.120
Difficulty of task	**-0.24**	-0.32 – -0.15	**<0.001**
Age	0.01	-0.03 – 0.05	0.635
Sex (1 = female)	**-0.27**	-0.46 – -0.07	**0.008**
Digital Skills	0.02	-0.00 – 0.03	0.053
Information Literacy Self Efficacy	-0.00	-0.03 – 0.02	0.841
Superficial Evaluation	**0.03**	0.01 – 0.06	**0.008**
		Marginal R2	0.188
		Conditional R2	0.199

People gave the right answer to the task (yes=1)

	Predicting Success (N=363)		
	Odds Ratios	CI	p
Intercept	0	0.00 – 0.10	**0.019**
Duration to finish task	1.71	0.88 – 3.31	0.111
Number of Search Actions	0.92	0.78 – 1.08	0.296
Number of Result Actions	1.02	0.94 – 1.12	0.573
Number of Queries	1.01	0.85 – 1.20	0.902
Number of Query Revisions	**2.17**	1.22 – 3.88	**0.009**
Importance of task	1	0.75 – 1.33	0.983
Prior Knowledge on topic	**1.5**	1.08 – 2.07	**0.015**
Difficulty of task			
Age	0.94	0.84 – 1.05	0.285
Sex	0.67	0.37 – 1.21	0.182
Digital Skills	**1.42**	1.11 – 1.82	**0.005**
Information Lit. Self-Efficacy	**1.78**	1.28 – 2.46	**0.001**
Superficial Evaluation	**0.88**	0.82 – 0.95	**0.001**
Query Revisions * Task Knowl.	0.79	0.63 – 0.98	**0.036**
Digital Skills * Self Efficacy	0.99	0.98 – 1.00	**0.001**
		Marginal R2	0.178
		Conditional R2	0.337

AIC: 412.9 --> 384.8

People gave the right answer to the task (0/1)

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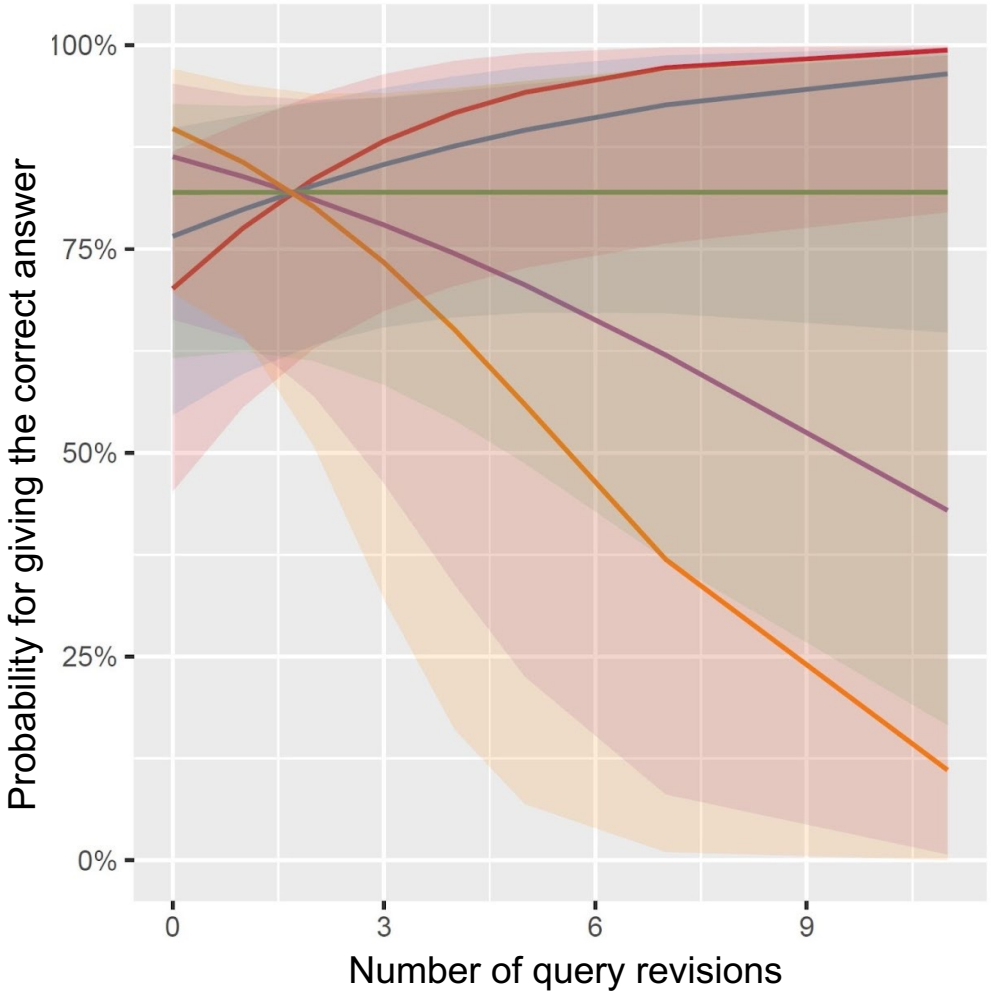


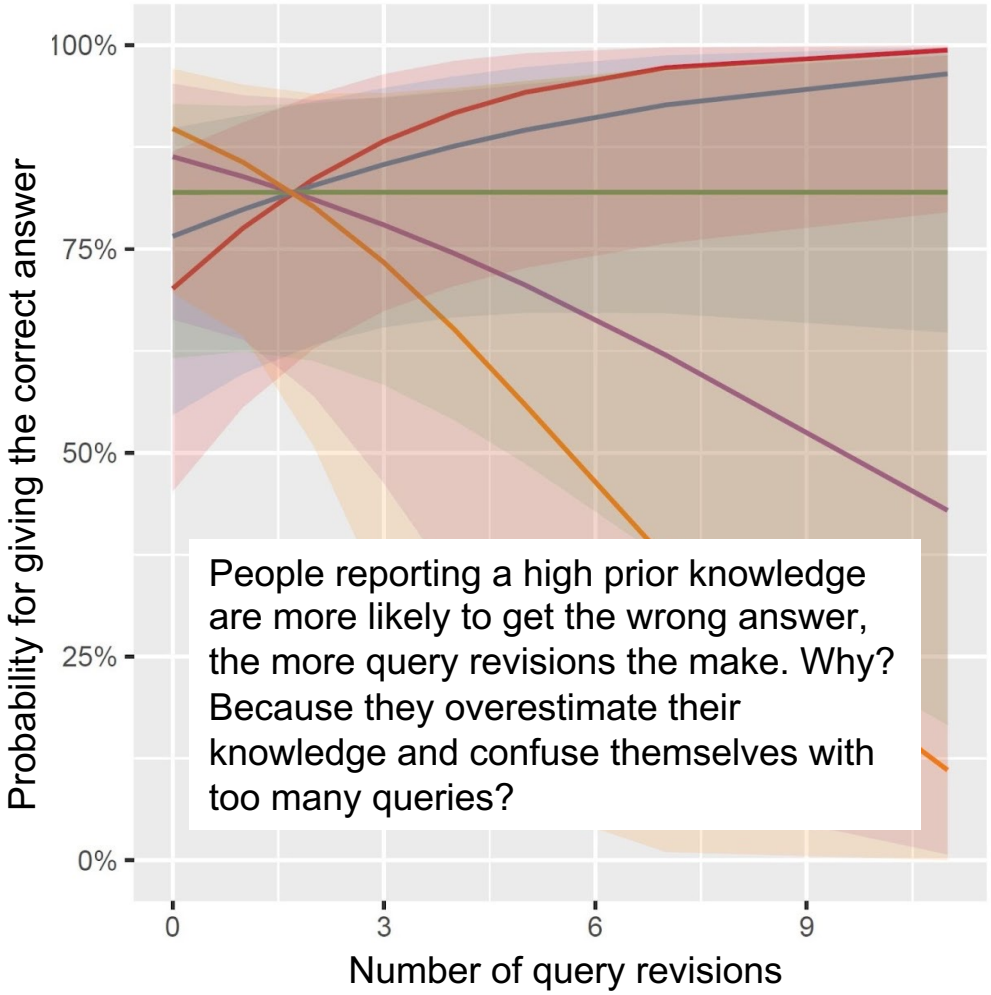
Prior knowledge

- very low
- low
- average
- high
- very high

The correlation between number of query revisions and probability for a correct answer depends on the task knowledge….

…it‘s positive for very low and low knowledge

…it‘s negative for high and very high knowledge

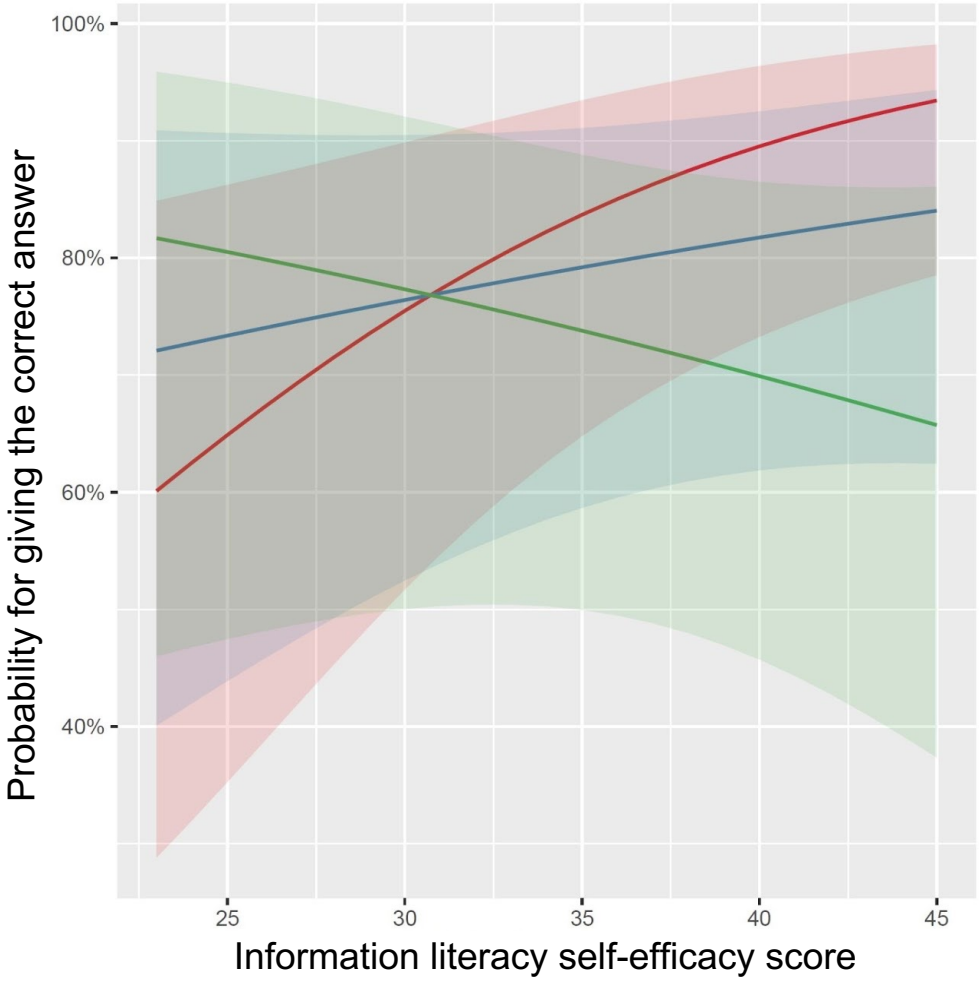


People reporting a high prior knowledge are more likely to get the wrong answer, the more query revisions the make. Why? Because they overestimate their knowledge and confuse themselves with too many queries?

The correlation between number of query revisions and probability for a correct answer depends on the task knowledge….

…it‘s positive for very low and low knowledge

…it‘s negative for high and very high knowledge



Digital skills

low - average

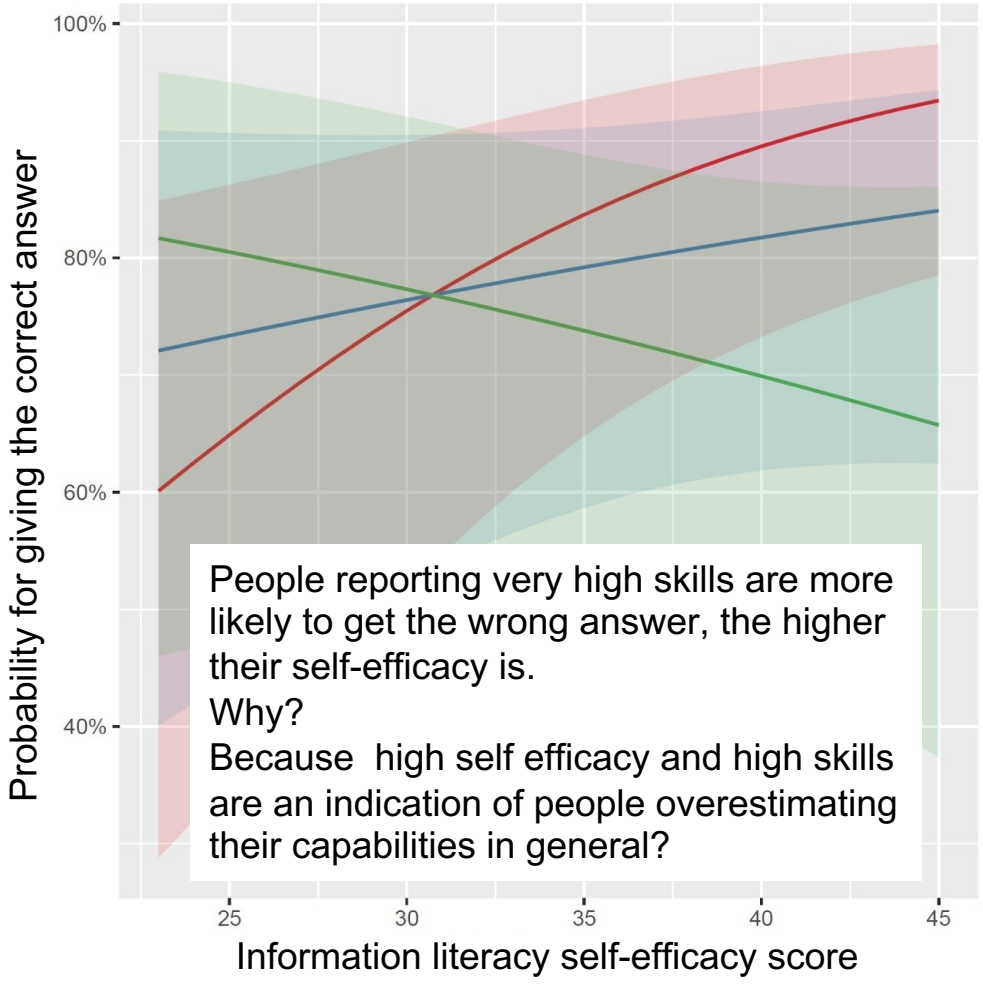
average - high

high - very high

The correlation between information literacy self-efficacy and the probability for a correct answer depends on the digital skills….

…it‘s positive for very low to high skills

…it‘s negative for very high skills



People reporting very high skills are more likely to get the wrong answer, the higher their self-efficacy is.
Why?
Because high self efficacy and high skills are an indication of people overestimating their capabilities in general?

Digital skills

- low - average
- average - high
- high - very high

The correlation between information literacy self-efficacy and the probability for a correct answer depends on the digital skills….

…it‘s positive for very low to high skills

…it‘s negative for very high skills

Conclusions

Searchers are more satisfied with the result they get when the search was long and important, but not too difficult….. and when they are male.

A person‘s skills, navigation style and task properties have a significant effect on search success

The complexity and the characteristics of different search tasks lead to relationships of different strengths between predictors and dependent variables, which can be countered with multilevel models

There may be complex interactions present, which may point at a group of over-estimators

- The number of query revisions has a positive effect on search success - but not for people who report very high prior knowledge. These participants may overestimate their prior knowledge and may get confused during the search? They more revisions they undertake, the less search success they achieve!
- Information Literacy Self-Efficacy seems to have a positive effect on search success - but not for people who report high digital skills. These participants perform worse, the higher their self-efficacy score is. They may overestimate their self-efficacy as well as their digital skills, which correlates with success.

Limitations

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- Task design is almost impossible to control Hypertext
- How about topics students can gather prior knowledge in school?
- Motivation: We tried to motivate people by the content of the task, but it‘s still an artificial problem/task
- We have some ideas why the interactions occur – but further investigation is needed.