

# Hypotheses of Information-Seeking Satisfaction Gaps: Demographics, Sources Usage, and Person-Source Fit

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## ABSTRACT

Informed by the knowledge gap theory, this study explored possible hypotheses on information-seeking satisfaction gaps. Using a survey of 1,000 Singapore Internet users and an ANOVA test, this research tested whether individuals' satisfaction with everyday information seeking varies by demographics and by the frequency of information sources usage. Interaction effects were also tested. Significant differences were found in the satisfaction level based on the income level and on the frequency of using all four sources tested. Three interactions were significant, two of which suggest lower satisfaction among lower socioeconomic status individuals who used the Internet or social media with moderate frequency. Five propositions were introduced for further testing.

## Keywords

Information behavior, social media, public libraries.

## INTRODUCTION

The provision of effective, equitable, and forward-looking information services requires an understanding of how changing socio-technological environments affect the information seeking (IS) outcomes of different population segments. Increasingly, scholars have highlighted the need to address the dearth of research on the outcomes of individual information behavior (IB), especially in the context of everyday life information seeking (ELIS) (Case & O'Connor, in press; Savolainen, 2008; Vakkari, 1997).

The current study reflects part of this effort towards the systematic investigation of IB outcomes. Specifically, it focused on one outcome aspect: an individual's overall satisfaction level with the results of his/her ELIS (hereafter, *ELIS satisfaction*). The IB in question was the frequency of using different information channels and sources (hereafter, *sources*), and this study tested three inter-related research questions (RQ). RQ1 was on the frequency of source use, specifically: Are frequent users of a source more satisfied

with the results of their ELIS than infrequent users? RQ2 focused on the salience of different sources: Among the sources tested, which source shows a stronger influence on ELIS satisfaction? RQ3 was concerned with the interaction effects between personal characteristics and sources usage. The question was: Is there a *person-source* fit that contributes towards differential ELIS satisfaction?

Following the approach towards building unit-level theory (rather than grand theory, predictive modeling, or population generalization), this research focused on testing a selected set of constructs. Of particular interest was the possibility of developing hypotheses on *information-seeking satisfaction gaps*, which are informed by the knowledge gap theory in the area of mass communication. The current analysis studied four sources: the Internet (i.e., traditional Web resources such as Webpages and search engines), social media (i.e., collaborative communities such as microblogs), public library e-resources, and public library physical resources. The first two sources were selected for their popularity, and the latter for their curated and high quality resources. Four core demographics were tested: age, gender, education level, and income level.

## LITERATURE REVIEW

While there is less large-scale empirical evidence on how individuals view their ELIS outcomes, the IB field has generated considerable knowledge on the perception and use of different information sources, as well as the individual and contextual factors affecting them. This literature informs the development of the three RQs.

RQ1 tested variations by sources usage, since the frequent use of a source may contribute to familiarity with the source and an increase in skills, which may contribute to better ELIS results. Contrarily, people tend to follow a habitual source use pattern (Harris & Dewdney, 1994). Due to necessity (e.g., limited access to resources) or choices (e.g., personal preferences), individuals may repeatedly use the same set of sources, even when those sources are not particularly effective in resolving their information needs. Chatman's (1991) theory of small world, for example, elucidates the intricate link between worldview and sources usage that can circumscribe the IS of disadvantaged groups.

RQ2 tested the relative salience of different sources on ELIS satisfaction. This is informed by literature on the

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strengths and weaknesses of various sources. For example, recent discussion suggests the collaborative potential of social media (e.g., Shah, 2012), which may contribute to better ELIS. In a study of international students' ELIS, the frequent use of social networking sites was found to associate positively with a higher perceived usefulness of the information acquired (Sin & Kim, 2013). Issues such as information overload and misinformation on social media, however, can negatively impact IS (Bawden & Robinson, 2009; Friggeri, Adamic, Eckles, & Cheng, 2014). Public libraries' resources may help alleviate the aforementioned IS issues, since they are curated. However, library resources are sometimes perceived as less accessible than open-Web resources (Kim & Sin, 2011).

RQ3 tested for a person-source fit. It examined whether individuals with certain characteristics derive from a specific source a higher level of ELIS satisfaction than other individuals. This is informed by the knowledge gap theory. Studies of knowledge gaps indicate that individuals with higher socioeconomic status (SES) derive greater knowledge from mass media and information campaigns than low-SES individuals. This gap is in part attributed to varying communication skills; prior knowledge; relevant social contacts; selective exposure, acceptance, and retention; and media that tend to cater more to certain population segments (Tichenor, Donohue, & Olien, 1970).

As technologies evolved, researchers contended that digital media might exacerbate the knowledge gap. This argument is not based entirely on concerns over the disparity in access to technology; it is also based on the variations in usage. Moreover, the Internet provides a more diverse information environment than traditional media, and the audiences are more fragmented (Bonfadelli, 2002). This contributes to higher possibilities of selective exposure, which is a factor underlying the knowledge gap discussed above. Using data from the 2008–2009 American National Election Studies Panel, researchers compared the knowledge gap associated with the Internet and traditional media usage. The education-based knowledge gap between heavy and light Internet users was found to be larger than with users of traditional media such as newspapers (Wei & Hindman, 2011). We hypothesize that there may be similar interaction effects on ELIS satisfaction.

## METHOD

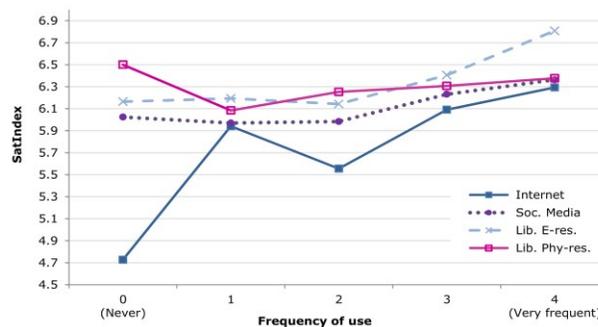
Data were collected using an online questionnaire, which included: (1) demographic questions; (2) questions on the frequency of using different sources; and (3) questions on the overall satisfaction with ELIS. The latter two groups were measured using 5-point Likert-type scales. The questionnaire was pilot tested before deployment. The survey was conducted by Qualtrics, using a quota sampling method to reach 1,000 adult Internet users in Singapore. As Internet users are generally younger, more educated and with higher income, the findings should be interpreted with these sample characteristics in mind.

The three RQs were analyzed using a multi-way ANOVA test. RQ1 was answered by examining whether the four sources were statistically significant. RQ2 was addressed by reviewing effect size statistics (partial eta-squared). RQ3 was answered by examining whether there were significant interaction effects. SPSS was used for the analysis.

## FINDINGS

Over half of the respondents were women (56.1%); 43.9% were men. A plurality were in their 30s (26.8%), followed by those in their 40s (26.3%), 20s (23.8%), 50s (17.0%), and those 60 years old and older (6.1%). A majority had university-level educations (67.0%), about 11.7% had post-secondary educations, while 21.3% had secondary-level educations or lower. In terms of income levels, 46% were in the middle income group, followed by 31% in the high income, and 22% in the low income groups.

The respondents were quite satisfied with their ELIS. On a 5-point Likert-type scale of 0 (*very unsatisfied*) to 4 (*very satisfied*), the mean satisfaction with the quality of the information found was 3.14 ( $SD = 0.61$ ); the mean satisfaction level on the steps needed for acquiring this information was 3.10 ( $SD = 0.70$ ). The two scores were summed to produce the *satisfaction index* (SatIndex). This index ranged from 0 to 8, representing the respondent's subjective satisfaction level with their ELIS. The Cronbach's Alpha of the index was 0.83, indicating satisfactory internal consistency. The mean SatIndex for the whole sample was 6.25 ( $SD = 1.21$ ). Regarding sources usage, respondents used the Internet most frequently to find information ( $M = 3.82$ ,  $SD = 0.59$ ; where 4 indicated very frequent/daily use). Social media was used with moderate frequency ( $M = 2.99$ ,  $SD = 1.41$ ), followed by visiting libraries to use their physical resources ( $M = 2.34$ ,  $SD = 1.07$ ). Accessing library e-resources from outside the library was done least frequently ( $M = 1.26$ ,  $SD = 1.34$ ). Figure 1 shows the mean SatIndex scores by source-use frequency.



**Figure 1. Mean SatIndex by frequency of sources usage**

## Hypothesis Testing Results

The ANOVA test found five significant main effects and three interaction effects (Table 1). Overall, the variables explained 22% of the variance in the SatIndex.

RQ1 focused on the statistical significances of the four sources, and all four were significant (Table 1). The post-

hoc Tukey HSD tests showed that, broadly speaking, significant pairwise differences primarily emerged between the “very frequent/daily” user groups and the “never” group, with the former reporting a higher SatIndex.

	SS	df	F	p	$\eta^2_p$
Gender (G)	1.60	1	1.18	.278	0.001
Age (A)	9.76	4	1.80	.127	0.008
Education (E)	0.05	2	0.02	.980	0.000
Income (I)	9.92	2	3.66	.026 *	0.009
Internet (Net)	18.25	3	4.49	.004 **	0.016
Social media (SM)	19.78	4	3.65	.006 **	0.017
Lib. E-res. (Lib. E-res.)	24.33	4	4.49	.001 **	0.021
Lib. Physical (Lib. Phy-res.)	12.98	4	2.39	.049 *	0.011
G * Net	0.79	3	0.19	.901	0.001
A * Net	16.43	12	1.01	.437	0.014
E * Net	12.60	6	1.55	.159	0.011
I * Net	26.36	6	3.24	.004 **	0.023
G * SM	3.27	4	0.60	.661	0.003
A * SM	26.92	16	1.24	.230	0.023
E * SM	23.37	8	2.16	.029 *	0.020
I * SM	12.77	8	1.18	.310	0.011
G * Lib. E-res.	11.27	4	2.08	.082	0.010
A * Lib. E-res.	16.24	16	0.75	.745	0.014
E * Lib. E-res.	7.65	8	0.71	.687	0.007
I * Lib. E-res.	6.40	8	0.59	.786	0.006
G * Lib. Phy-res.	3.19	4	0.59	.671	0.003
A * Lib. Phy-res.	11.49	15	0.57	.902	0.010
E * Lib. Phy-res.	22.18	8	2.05	.039 *	0.019
I * Lib. Phy-res.	10.72	8	0.99	.444	0.009

\*\* p < .01; \* p < .05

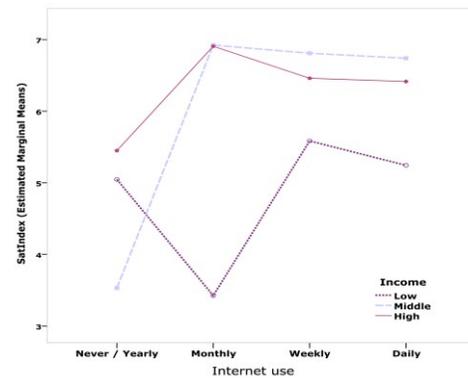
**Table 1. ANOVA test: Factors affecting SatIndex**

RQ2 investigated the effect sizes (partial eta-squared,  $\eta^2_p$ ) of the four sources (Table 1). The use of library e-resources had the largest effect size ( $\eta^2_p = 0.021$ ) on the SatIndex compared to the other three sources. This was followed by social media ( $\eta^2_p = 0.017$ ), the Internet ( $\eta^2_p = 0.016$ ), and library physical resources ( $\eta^2_p = 0.011$ ).

RQ3 explored the interaction effects, of which three were significant: (1) Income x Internet use frequency; (2) Education x Social media use frequency; and (3) Education x Library physical resources use frequency. The first interaction involved income and Internet use. Income was the only demographic variable that had a significant main effect (Table 1). The estimated marginal means showed a positive relationship between income levels and ELIS satisfaction (Low-income: 4.83; Middle-income: 6.00; High-income: 6.31). This main effect was modified by the Internet use frequency (Figure 2). Worth noting is the V-shaped drop for the monthly users among the low-income group. A similar V-shaped drop was found among monthly social media users who were in the two lower educational level groups (Figure 3). The third interaction effect showed a notable lower satisfaction for non-users of library physical resources who had a secondary or lower education.

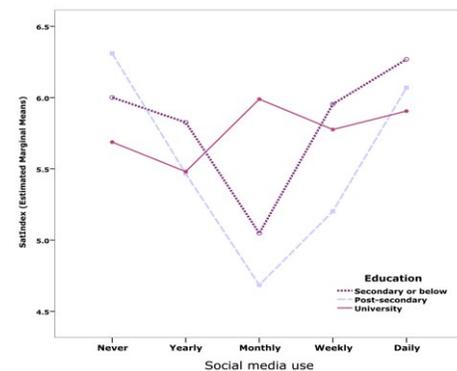
## DISCUSSION

This study found satisfaction gaps across user groups. Satisfaction varied with frequencies of sources usage (on all four sources tested) and demographics (income). Person-source fits were found, including a less satisfactory ELIS



Note: Due to the low number of respondents who reported they ‘never’ use the Internet for information seeking (n=11), the ‘never’ and ‘yearly’ categories were combined into one category for the ANOVA test.

**Figure 2. Interaction plot: Income x Internet use.**



**Figure 3. Interaction plot: Education x Social media use**

among lower income-monthly internet users, and among lower education-monthly social media users, when compared to other demographic-source use combinations.

**Proposition 1:** ELIS satisfaction is more affected by source use behavior than by individual demographics.

This is based on the RQ1 findings, where all four sources were significant but only one demographic (income level) was significant. The effect sizes of the four sources were all larger than that of income level ( $\eta^2_p = 0.009$ ).

**Proposition 2:** Online resources have stronger effects on ELIS satisfaction than physical resources.

This is informed by the RQ2 results. The findings agree with the frequent observations that accessibility is a top preference for many individuals, which may partly explain the stronger satisfaction with the three online resources over library physical resources. Library e-resources showed a stronger effect size than the Internet and social media, which is a positive finding on the value of public libraries. Future research may compare these effect sizes against that of interpersonal sources, which is another major category of sources that people consult.

**Proposition 3:** There is an ELIS satisfaction gap based on SES, similar to that of the knowledge gap theory.

The study found a positive relationship between income and

satisfaction (RQ1). Possible mechanisms include the different range and quality of access available to different groups (e.g., better computer equipment, speed of Internet, subscription to fee-based online sites, time available for library visits). Income also likely served as a proxy for variables not directly tested in this analysis (e.g., social capital). These variables can be tested in future models. Moreover, the low-income group was notably less satisfied with ELIS. Even though the information gap may not be as severe as before, it is still an area that needs examining.

**Proposition 4:** Lower-SES individuals who use the Internet or social media with moderate frequency (e.g., monthly) attain relatively lower ELIS satisfaction.

**Proposition 5:** Library e-resources, partly due to their curated nature, induce less variation in ELIS satisfaction across SES groups than the Internet or social media.

The results from RQ3 informed the above propositions. One possible explanation is that Internet and social media are more challenging in terms of quantity and quality issues. Since the task of credibility assessment falls primarily on the users, there is a greater chance that users with varying characteristics may experience different levels of success and satisfaction. People who rarely use the Internet or social media are less likely to have their overall ELIS substantially affected, whereas frequent users may be able to overcome some of the problems due to skills gained from frequent usage. Higher-SES individuals may have more resources (e.g., information literacy skills) to help them manage these issues. This would leave the lower-SES and moderate frequency users in a relatively less favorable position. A similar pattern was found in social media information seeking among U.S. college students. Students who used microblogs with moderate frequency reported higher levels of problems (e.g., encountering non-credible, information) than frequent and infrequent users (Sin, in press). Further verification of the prevalence of this pattern is encouraged.

## CONCLUSION

This study found varying ELIS satisfaction by frequency of source use and income level. The interaction effects and the mechanisms behind them are of interest. Singapore has high broadband Internet and social media usage. It is posited that other highly networked nations may find patterns similar to this study. Further hypothesis testing will help verify the nature and extent of potential satisfaction gaps across diverse user groups in different nations. The current study used a nomothetic approach to test potential patterns across a large number of respondents. In-depth investigation of the views of users were beyond the scope of the study. Further research may apply an idiographic approach and use qualitative methods to arrive at rich description of the perception and experience of individuals. This will allow method triangulation and a more comprehensive understanding of the research topic, which will ultimately contribute to the planning of more effective and equitable information services for every user.

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