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MORE INFORMATION

FROM & ABOUT THE NEED FOR

MORE INFORMATION

Christian Baden

Amsterdam School of Communications Research (ASCoR)

University of Amsterdam

Paper to be presented at the International Communication Association (ICA) Annual Conference in San Francisco, CA, 24-28 May 2007.

Correspondence address: Christian Baden, ASCoR, University of Amsterdam, Kloveniersburgwal 48, 1012 CX Amsterdam, The Netherlands. Email: c.baden@uva.nl

Abstract

This article investigates the relationship between peoples' information needs and their choices in media use. People seek information as far as they believe that knowing more about an issue is worthwhile. They search for different information, in different media, depending on what knowledge they desire. This article outlines four kinds of information needs, which are identified in survey measures of information seeking behaviour. Testing the proposed relationships using survey data on European political information (Eurobarometer 52.0), it is possible to connect peoples' knowledge and knowledge goals, via distinguishable information needs, to their media preferences. It is shown that the perceived sufficiency of knowledge, which depends on subjective knowledge goals, guides information demands. The amount of previous knowledge determines what kind of information is sought, which in turn relates to media preferences. With higher knowledge, people develop different and more advanced information needs, which they seek to satisfy using different media.

More Information From & About the Need for More Information

When we talk about individuals' media choice, we almost always have some implicit notion of needs in mind: People attend to those media they expect to satisfy their perceived needs best. Uses and gratifications (U&G) research has identified many such needs, one of which is the need for more information. However, an often-acknowledged difficulty is that the notion of information need is not very well understood (Elliot, 1974; Kuhltau, 1999). In some cases, information needs are simply assumed, which leads to problems *explaining* different media orientations from non-varying needs (Dervin, 1994).

In most research, information needs are measured via survey methods. Media use is then predicted from people's needs, operationalized as self-reported knowledge or desires. However, the use of these survey indicators at face value is problematic at best. Several mismatches hint at a more general problem: While people consistently demand more information, they hardly use it when it is offered (Baden, 2004). Certain information offers are used predominantly by those who claim not to need more information (Marcella & Baxter, 2000). Still, people feeling insufficiently informed appear capable of relatively informed choices (Just, Crigler, Alger et al., 1996; Popkin, 1993). Czesnik (2003) showed that self-perceived and actual political knowledge were not closely related at all. These paradoxes can be traced back to one fundamental question: What do people mean when they claim to "feel informed"? (Frants & Brush, 1988). As the observed mismatches indicate, this is neither merely a reflection of actual *knowledge* (and knowledge deficits), nor does it translate directly into information *behaviour*.

To conceptualize users' media choices based on information needs, it is necessary to understand what constitutes these needs. Once we understand why and when people perceive a need for more information, we can proceed to explain their information behaviour from this. The main research question of this paper thus asks: What role do information needs play in explaining

media choice? This paper utilizes the existing survey measures, while accounting for the seeming inconsistencies between people's knowledge, perceived informedness, and information seeking behaviour. Investigating the processes underlying the reported self-assessment, this paper argues it is possible to infer specific kinds of information needs from survey responses. These needs can then be linked to observable media use patterns. The developed hypotheses are tested using large-scale survey data on political information behaviour in Europe (Eurobarometer 52.0).

Previous research

Information needs have been tackled, largely, by two research traditions:[1]

First, in mass communication research, the U&G approach has identified different information needs that people satisfy using media (Katz, Blumler, & Gurevitch, 1973). According to U&G models, information needs do not arise "objectively" from levels of individual knowledge, but depend on peoples' dispositions and social environments (Rosengren, 1974). However, this general observation is hardly further substantiated. Provided models, and certainly the empirical studies, tend to start at the point where an information need has already been identified. They categorize occurring needs, claiming their consequentiality for media behaviour, but rarely investigate their antecedents. Categorizations remain driven by the characteristics of the investigated media, which severely limits the explanatory power of needs (Katz, Blumler, & Gurevitch, 1973). For an account of users' media choice, we must therefore connect information needs to both their consequences *and* their origins. So far, most contributions from research focus on the consequences.

In particular, mass communication research has provided some tools to identify media types best suited to address information needs. This suitability to satisfy needs has been assessed predominantly in two ways: a) as the amount of accessible information, or b) as learning impact (for a review see Eveland & Dunwoody, 2001; Romizowski, 1988). However, this analytic knowledge is usually not available to media users. Instead, people usually base media use decisions upon hunches and satisficing routines. Often, they can already satisfy information needs by re-

focussing attention within their usual media use. From experience and socialization, people know roughly what information they can expect to find in which channels. Media choice is thus fundamentally driven by habits and previous experiences. Customs are likely to prevail in most cases (Schneider, 2006). Only rarely and limitedly will people deviate from those, to better seek their gratifications from media information.

As a second body of research, a user-centric approach in information science has tried to trace back information seeking behaviour to its psychological origins. Starting from professionals' information needs and search behaviour, researchers have attempted to widen applicability towards lays' searches (Dervin & Nilan, 1986; Vakkari, Savolainen, & Dervin, 1997). In particular, advanced models describe how people transform ambiguous information needs into concrete queries. This implies a process of iterative refinement (Wilson, 1999), utilizing cues and previous experience: Even if people do not know what exactly they are looking for, they are still able to use sources strategically. Citizens often face precisely this kind of information need: They know they do not know a lot, but they are unsure what exactly they want to find out. Thus, they scan available sources for cues to refine their queries. Based on previous experience and identified cues, people estimate the likely cost and utility of information compared to their current state of knowledge. Finally, appropriate searching strategies are selected (Wilson, 1981).

Thus, once we have roughly outlined an information need, we are well-equipped to trace its further path: Information science explains the iterative concretisation, selection and direction of queries. Mass communication research provides some starting points as to where people might look for answers. However, what this need for information *is* remains unclear (Kuhltau, 1999).

Information needs & knowledge

Information needs have been conceptualized as entirely subjective (Park, 1994; Rosengren, 1974), arising from two mismatching self-perceptions: the assessed knowledge, and the desired knowledge about an issue. This mismatch gives rise to an "anomalous state of knowledge" (ASK) (Belkin, 1980), which triggers an iterative process of refinement. The ASK is an endogenous vari-

able: The perceived mismatch arises only if people consider their knowledge about an issue in relation to what more they perceive as worth knowing. Which issues are considered depends on aspects rendered salient, on primed relevancies, and social context (Ingwersen, 1992). Whether an ASK is pursued further is subject to re-evaluations and decisions throughout the refinement process. Any actual state of knowledge may or may not lead to an information need. Subsequently, any information need may or may not result in searching behaviour (Wilson, 1981).

Consequently, ignorance should become problematic only if the possibility of having deeper knowledge is considered at all, and perceived as important. It might be interesting to investigate to what extent people are usually aware of their ignorance on various issues. However, this cannot be addressed via survey data: By asking, surveys induce everyone to consider her knowledge about the enquired issues. Still, people may attribute different relevancies to their considered knowledge, and knowledge gaps. High attributed relevance then founds ambitious knowledge goals. Indifference, conversely, leads to goals which are so low that they are satisfied regardless of the level of possessed knowledge (Matthes, 2005). People with moderate or low knowledge goals should at some point be satisfied with their information states, whereas those with high goals should not. As long as the knowledge goal is not yet satisfied, people should demand more information. Satisfaction means that additional information is not valued any more: There is no information need (Dervin & Nilan, 1986). Higher knowledge translates into feeling better informed only as long as additional information is valued (Lutz, 2003). If there is no need for more information, any knowledge state should yield the same satisfaction. As long as there is an information need, perceived informedness continues to rise with information gain (see also Schönbach, 1983).

At the same time, people should still be aware of the absolute amount of knowledge they possess. Thus, more knowledge should generally lead to higher perceived informedness. However, individuals may give varying weight to this aspect. Those largely disinterested should give a fairly accurate account of their actual knowledge. The consideration of feeling *sufficiently* informed

is irrelevant to them. This evaluation of sufficiency, however, is inherently more salient than the self-assessment, because of its link to attributed relevance. Thus, the more interested people are, the more they are expected to weigh the satisfaction of their knowledge goals over their absolute level of information. Thus, even with high knowledge they may feel relatively uninformed compared to their desired knowledge. The interaction of these two processes leads to a nonlinear positive relationship between actual and perceived knowledge: As long as people desire more information, perceived informedness should rise. Once the goal is satisfied, the curve reaches a ceiling. Beyond this, information no longer contributes to achieving the knowledge goal, and therefore is not valued any more. People who attribute very high relevance to an issue pursue goals that are never fully accomplished, so the ceiling does not appear.

From this follow the first two hypotheses:

H1: People feel better informed the more knowledge they possess. This relationship is moderated by relevance attribution, and strongest if people care little about an issue. When people attribute more relevance, this relationship is increasingly overridden by an assessment of being *sufficiently* informed. This results in a non-linear positive relationship, which approaches a ceiling.

H2: People demand more information only as long as their self-assessed knowledge is lower than their knowledge goals. Thus, as they feel more sufficiently informed, the demand for information should fall. Actual knowledge alone should play a minor role only.

Information uses & foci

If there were only one kind of information need, this could impossibly explain different media choices. For a further investigation, it is thus necessary to discriminate between different types of information needs (Matthes, 2005). The most familiar differentiation concerns the use of information. First, information serves to discover new fields of possible knowledge (Atkin, 1972; Schneider, 2006), and to qualify the desirability of this knowledge (McCombs, 2004). This use of information focuses on relevance cues, and requires comparative assessment (*relevance- and desir-*

ability assessment). Second, information can be used to acquire selected knowledge (Frants & Brush, 1988; Savolainen, 1999; Schwabe, 1997).[2] *Knowledge acquisition* requires substantive information on the facts and relations constituting an issue.

Another differentiation concerns the focus of information. This point has attracted most attention in research on political knowledge. Broadly, information can focus on facts or process (Garramone & Atkin, 1986; Schönbach, 1983). Factual knowledge is generally held to be less complex and thus easier to acquire than process knowledge (Culbertson & Stempel, 1986, Garramone & Atkin, 1986). This differentiation matters mainly because both information types relate to different ways of understanding an issue. While factual information introduces exogenously determined situations, process information connects situations to origins and implications, and thus highlights the possibility of change (Baden, 2004). Particularly in a political information context, knowledge of structures and processes is required for political action and opinion formation (*process-oriented information*) (Lutz, 2003; Popkin, 1991). Factual information, which takes political outputs as given, is more geared towards passive adaptation, and potentially deters further involvement (*output-oriented information*). Chew (1994) has shown that people focused on either kind of information depending on pursued participation respectively adaptation goals (see Instytut Spraw Publicznych, 2001; Schwabe, 1997).[3]

Combining these distinctions, four uses of information are systematized in Table 1: Relevance- and desirability-assessment of output-oriented knowledge, acquisition of output-oriented knowledge, relevance- and desirability-assessment of process-oriented knowledge, and acquisition of process-oriented knowledge. This enumeration also represents an inherent sequential order of information needs, from basic to more advanced applications: On the one hand, the discovery and selection of relevant knowledge precedes targeted knowledge acquisition. On the other hand, process-oriented knowledge derives its relevance partly from the recognition of output-oriented knowledge. This is particularly clear in political information: Only if people understand that political outputs affect them at all, they are motivated to investigate the underlying processes and

form a participation-oriented opinion.[4] Therefore, assessment of desirability occurs prior to knowledge acquisition, and concern with output-oriented knowledge precedes interest in process-oriented knowledge.

TABLE 1 ABOUT HERE

The more people know about an issue, the further they should thus proceed from basic towards more advanced information needs. From this, two more hypotheses can be derived:

H3: Demand for knowledge-acquisition information is associated with higher knowledge than demand for relevance-assessment information.

H4: Demand for process-oriented information is associated with higher knowledge than demand for output-oriented information. However, this relationship is moderated by relevance attribution: Acquiring complicated background knowledge requires more motivation than gathering facts. Thus the effect occurs mainly among interested citizens.

Information sources

The introduced types of information can be associated with certain narrative formats and information strategies, which are characteristic for different media (van Eijck & van Rees, 2002; Eveland, Seo, & Marton, 2002; Robinson & Levy, 1986). For instance, political magazines take peoples' relevance attribution for granted, and focus on the background of political decisions. Newscasts usually list selected information bits, suggesting their relevance. They rarely cover underlying processes (Iyengar, 1991). In as far as media provide different kinds of information, they sustain a "division of labor among media" (Katz, Haas, & Gurevitch, 1973, p. 172; Bouwman & van de Wijngaert, 2002; Garramone & Atkin, 1986).

Through media socialization, people are roughly familiar with different media's emphasis on providing information. Therefore, they are capable of attending media strategically (Chew, 1994; van Eijck & van Rees, 2002; Katz, Blumler, & Gurevitch, 1973; Tewksbury, 2003). When-

ever people feel they lack certain information, they have an idea which media are likely to supply it.[5] Obviously, this is no deterministic process. Media converge, and also within one media channel there are formats pursuing different information strategies. Thus, it is impossible to provide an exhaustive, mutually exclusive assignment of information types to media channels. However, some general tendencies can be identified.

"Each medium seems to offer a unique combination of: (a) characteristic contents […] (b) typical attributes […]; and (c) typical exposure situations […]. The issue, then, is what combinations of attributes may render different media more or less adequate for the satisfaction of different needs" (Katz, Blumler, & Gurevitch, 1973, p. 514). By far most publications dealing with comparative media characteristics concern differences between newspapers and television. There is some consensus that television is better suited to deal with "itemized" knowledge and simple facts. Complexity and background information tend to be associated with print media (Chew, 1994; van Eijck & van Rees, 2002; Garramone & Atkin, 1986; Graber, 2001; Robinson & Levy, 1986; Schönbach, 1983). What is more, television is said to be the main medium for monitoring the political environment (Kaye & Johnson, 2004). Some authors assign this function also to newspapers. They argue that people gain awareness of new issues wherever they are likely to encounter information they hadn't been searching for (Schönbach & Lauf, 2004). Audiences then use relevance cues to assess the desirability of information on encountered issues. The formatting of both television and newspapers contains plenty of such cues.

Online sources, by comparison, provide little guidance for audiences. The Internet is a typical "research" medium: It relies on user activity much more than the "display" media, TV and newspapers. People retrieve and encounter information online only as far as they have been searching for it (Schönbach, De Waal, & Lauf, 2005). However, the hypertextual presentation of online information supports the acquisition of complex knowledge (Eveland, Seo, & Marton, 2002). The same has been said about the possibility to re-read information. Print sources also allow re-reading, while broadcast doesn't. Magazines resemble print newspapers, but should even

more be able to cover issues in context and at length. Encounter chances and relevance cues are reduced, because magazines are mainly used selectively and strategically. Newspapers, on the contrary, are usually read habitually and without too much pre-selection (Savolainen, 1999). In that respect, magazines are more similar to online sources. Radio seems to share most characteristics with television. Both can be characterized by likely encounters, linear presentation, itemized content, and strong relevance cues. Due to lacking visual information radio's power may be reduced, though. (Graber, 2001). Summing up, TV and radio are directed mainly at the relevance-assessment type of information. Newspapers both serve as monitoring media and provide more in-depth coverage. Magazines and online sources, as research media, can be associated with knowledge acquisition.

For the distinction between factual and process knowledge, the case is less clear-cut. For example, political magazines could be said to focus on process-oriented information. Still, consumers' or finance magazines predominantly cover output information. A survey by the Polish Instytut Spraw Publicznych (2001) showed that people made clear distinctions also within media channels. There, unspecified formats were demanded less both on TV, radio, and newspapers. However, outlets focusing on output information were very much in demand within each channel. Process-oriented formats met a demand among higher educated respondents, but failed to attract interest elsewhere.[6] Calculations based on the same survey suggest that magazines were seen as tilted towards process knowledge. Newspapers were associated with output knowledge (see also Neuman, Just, & Crigler, 1992). This also relates to journalistic practice: In newspaper stories, quality standards demand a focus on novel information. This puts the stress on output rather than underlying processes. Furthermore, many newspapers feature advice-sections, in which practical details of policies' impacts are spelled out. Among magazines, both information foci occur, however political magazines strongly tend towards process-orientation.[7] Thus, while admittedly crude, associating process-orientation with magazines, and output-orientation with newspapers, seems justifiable.

In summary, information provision strategies vary between media. In choosing particular media, people are thus able to seek out information most suitable to their needs. Obviously, habitual media behavior remains the default strategy: Shifting attention within channels often suffices to address needs. Also, needs may be too vague and weak to overcome the inertia of habits (Schneider, 2006; van de Wijngaert, 1999). However, where media preferences deviate from habitual use, one plausible explanation is that people seek information they expect to find in these media channels (Tewksbury, 2003).

The case of European political information

Based on these considerations, I will now develop an empirical test of the presented relationships. As an illustrative case, I focus on information needs and media use concerning European political information.

Although admittedly specific, the case of EU-related information facilitates both empirical testing, and connecting to an ongoing scientific debate. Current reformulations of European information policies have given some salience to citizens' EU-related information needs (European Commission, 2006a; 2006b). Citizens' knowledge and information needs have been connected to the provision of EU-related information in the media. Availability of information as well as demand for it have been found lacking, leading to a communication deficit (Meyer, 1999). The low visibility of European politics in the media insufficiently raises the public's awareness of European issues. Event-centered coverage renders information relatively inaccessible, and suggests the irrelevance of European everyday politics. Lacking representation of the political process and conflicts hides vast fields of political knowledge from the people (De Vreese, 2004; Peter & De Vreese, 2004). Participation is deterred by a presentation of European politics as exogenous facts, rather than political processes. People thus have, and seek, little knowledge regarding Europe, jeopardizing democratic legitimacy and popular participation (Meyer, 1999). The popular perception of information needs thus lies at the core of the EU's communication deficit.

Practically, the main advantage of the European case lies in the plentiful availability of data. The EU context, however, also helps overcome another problem. Given widespread political ignorance, information needs tend to be treated as given. To test the proposed hypotheses, however, it is necessary to examine a case that shows sufficient variation. This requires that respondents attribute different relevance to lacking information. Unlike national settings, the European case should meet these requirements. On the one hand, every citizen should be able to recognize the potential value of political information: Voting rights as well as citizenship norms provide a sufficient base (Delli Carpini & Keeter, 1996; Popkin, 1991). On the other hand, the EU context is generally held to be less obtrusive. It appears to be relatively legitimate and common to admit low knowledge and low concern about it. While in a national context certain assumptions are relatively universal (e.g., political decisions matter, elections influence politics, etc.), in the EU this is not so clear. More than general social desirability, subjective considerations should account for information demands.

METHOD

Data & Operationalization

To test the hypotheses presented above, I used survey data from the Eurobarometer wave 52.0 (N = 16071;[8] 52,2% female, median age group 25-44 years). This wave was chosen because it included the fullest range of required items. All used entries were recoded such that higher values represented higher agreement or presence of attributes. Missing answers that could be interpreted as substantially equivalent to valid codes were replaced.[9]

The survey measured self-perceived informedness regarding European political issues asking respondents to rate their knowledge on a scale from 1 (*know nothing at all*) to 10 (*know a great deal*) (M = 4.30, SD = 2.04, N = 15822).[10] To examine how this perceived knowledge (*pk*) relates to actual knowledge (*ak*) and knowledge goals, two more indicators were required. To assess the actual knowledge level, three sets of questions formed a composite measure. One battery of nine questions assessed the range of European Institutions people claimed being aware of. This was

combined with the percentages of correct responses in two quizzes (asking for names of EU politicians, and some technical but widely publicized aspects of the Euro introduction).[11] Thus, three broad fields of knowledge contributed one-third each to the composite actual knowledge measure (M = 1.32, SD =.71 [Range: 0 - 3], *Cronbach's* α = .809, N = 16071).

Knowledge goals were assessed indirectly, using the attribution of relevance to European knowledge as a proxy.[12] To measure this relevance attribution (*ra*), another composite indicator was formed. This one included attention to and interest in European political information, and support for teaching such information at school. Attention was measured asking respondents directly how much attention they paid to several news topics. The values for European and political information entered the indicator. An interest measure was only available regarding information on the Euro.[13] However, since this issue appears also in the actual knowledge score, and was highly salient at the time of the survey, this was included as well. Finally, agreement with the statement that "Children should be taught at school about the way European Union institutions work" (Q33) was added. This question was taken as an indicator for the belief that having some knowledge of European politics is important. Each question taps another aspect of the attribution of relevance to EU-related knowledge (M = 2.36, SD =.92 [Range: 0 - 4], *Cronbach's* α = .621, N = 16071). All three indicators introduced above show large variance and are approximately normally distributed.

To assess media preference, five information demand (*id*) indicators (television, radio, newspapers, magazines, online) were calculated. People were asked how "[i]n general, [they] would […] prefer to get information about the European Union." (Q19). Each medium was coded one if mentioned, and zero otherwise. To focus the preference measure on the deviation from habits, the current use of the each source for EU information was subtracted.[14] Thus, the demand indicators represent the desire for more, or less, information than currently received. All indicators range from minus one to one, and include N = 16071 cases ($id_{television}$: M = -.13, SD =

.53; id_{radio}: M = -.09, SD = .46; $id_{newspapers}$: M = -.13, SD = .52; $id_{magazines}$: M = -.10, SD = .42; id_{online}: M = .00, SD = .27).[15]

From the five demand indicators, the total information demand was calculated by simple summation. ($\Sigma(id)$: M = -.09, SD = .25 [Range: -1 – 1]). Also from these indicators, I created a measure of the relative information demand (*rid*) orientation towards each channel.[16] ($rid_{television}$: M = .19, SD = .04; rid_{radio}: M = .20, SD = .04; $rid_{newspapers}$: M = .19, SD = .05; $rid_{magazines}$: M = .20, SD = .04; rid_{online}: M = .21, SD = .04; No change at all yields scores of .2 on a scale from .077 to .429; N = 16071) This measure is neutral to the number of sources mentioned, and only reacts to differences in orientation between sources. Also, it shows much better variation than the absolute measure, because it includes data on a respondent's total information demand as well. To assess the orientation towards different information types, I analysed and interpreted the demand from each media channel separately. Due to the only approximate assignment of media channels to information types, it appeared recommendable not to merge the media-specific indicators into information type indices. To construct such indices, one would have to isolate clear-cut examples of sources dedicated to one kind of information. Unfortunately, this differentiation within media channels was not available from the data. Also, calculating the demand scores required equivalent data about current and preferred information sources, which prohibited using other, more detailed surveys. The crude codes provided by Eurobarometer still represent the best available source of such data.

Analysis

Testing the advanced hypotheses required two main strategies of analysis. The first hypothesis, linking actual knowledge via a nonlinear, interest-moderated relationship to perceived knowledge, was assessed using OLS regression. The same strategy was chosen for the relationship between perceived knowledge and information demand, which was proposed in H2. Each regression was run as minimal model (containing only the theorized components), and as a controlled model. As controls, some socio-demographic variables known to matter in relation to

political knowledge were included.[17] Also, general media use (Q13) was entered as theoretically relevant. This controls for the possibility that information demands reflect not a strategic choice, but the desire to find more information in those media used habitually. To examine whether subjective information needs or social desirability guide self-reports and media preference, the influence of citizenship duty norms was tested as well.[18] With regard to the large number of cases in the Eurobarometer survey, correlations failing to achieve significance below .001 level were disregarded. Also, similar models were routinely estimated and effects evaluated for their robustness. Due to the low variation of the indicators measuring information demands, ANOVA tests were chosen to address the latter two hypotheses. These examined the differences between people demanding more, unchanged, and less information from a source. Both the strengths of association between media orientations and individual knowledge, and the absolute levels of means were analysed. Based on these, it was possible to characterize those groups of people oriented towards specific types of information.

RESULTS

Confirming the first claim of H1, actual knowledge explains about a quarter of the variance in perceived knowledge (Adj. $R^2 = .251$, $\beta = .501$, $p < .001$, $N = 16071$). Regression reveals that actual knowledge interacts with relevance attribution (Table 2, Model 1). Consequently, separate estimates for different relevance levels were run. *R*-squares fall visibly for the reduced case range, because the well-explained variation between the case groups drops out of the analysis. As expected, for low relevance attribution a linear model fits best (Model 2). For medium relevance attribution, a quadratic equation is estimated (Model 3): Perceived knowledge rises it until it approaches a ceiling within the possible range of values (Figure 2). For high relevance attribution, a linear model shows the best fit again (Model 4). With higher concern for European issues, the influence of actual on perceived knowledge retreats, reducing both betas and overall model fit: The more people care, the more weight subjective knowledge goals assume in their informedness estimates. H1 is confirmed.

TABLE 2 & FIGURE 1 ABOUT HERE

The second hypothesis is supported as well. The Pearson correlation between perceived knowledge and the total information demand is negative and significant (R = -.175, $p < .001$, N = 15822). The more informed people feel, the less further information they demand. Regressing the total demand on all knowledge-related indicators shows that perceived knowledge remains clearly the largest explanatory factor. However, *R*-squares remain unsatisfying low. Both actual knowledge and education are consistently significant as well, both with negative signs. Relevance attribution loses significance after including actual knowledge. Age becomes (positively) significant only after media use is included. The alternative explanation – that information demands stem mainly from a feeling of citizenship duty – fails to gain support: Those regarding citizenship duty as an important reason to vote in European elections do not show larger information demands. Table 3 shows the estimated regression models.

TABLE 3 ABOUT HERE

Also the demands directed towards individual media channels were analyzed, assessing the effect of actual knowledge. A series of ANOVA's compared the characteristics of people demanding more, unchanged, and less information from each channel. Since H3 and H4 focus on the orientation of demands among different sources, the relative indicators were used for this analysis. In all cases, mean characteristics differed significantly between those demanding more and less information, as shown in Table 4. At one end, television orientation declines with higher knowledge (both actual and perceived) and education. At the opposite end, both online and magazine orientations increase with higher knowledge and education. This corroborates H3: With higher knowledge, different information sources come to the fore. Information needs shift from

monitoring to knowledge-acquisition. For online sources, and less clearly so for magazines, higher relevance attribution is conducive as well. The strength of the association increases considerably if one discounts the large group of indifferent individuals, who mention neither source at all (not shown). Thus, as predicted, only those with higher concern orient towards research media requiring much user activity. Unexpectedly, radio joins with magazines and online: Radio preference is positively related to knowledge. Newspaper orientation behaves similarly to television, only weaker. This lends some support to H4: People with lower knowledge are oriented more towards newspapers, whereas with higher knowledge people prefer magazines.

TABLE 4 ABOUT HERE

Finally, it was investigated at which absolute knowledge level certain media channels come to be preferred. As Table 5 shows, both people demanding more and less information are, on average, more knowledgeable than those demanding no change.[19] Disregarding the indifferent group, the mean actual knowledge values of those demanding more and less information are plotted in Figure 2. Interpreting the plot requires some caution, because the "demanded less" side is logically partly dependent on media use.[20] However, the pattern is consistent with the expectations from H3 and H4. Online preference is associated with the highest mean knowledge score of all groups. Magazine and radio demanders score similarly, and clearly above those demanding more information from television and newspapers. Media source preferences do not only vary systematically between groups with different knowledge; demand for certain sources can furthermore be associated with specific information needs arising at certain levels of knowledge. Still, the explanatory power of the results remains rather weak. However, this is mainly a result from the low variance of the measures underlying the demand indicators, and reflects the heavy influence of habits in media choice. Upholding this important reservation, the expectations from H3 and H4 are confirmed.

TABLE 5 & FIGURE 2 ABOUT HERE

DISCUSSION

As the empirical test corroborates, the proposed conceptualization of information needs contributes to a more thorough understanding of peoples' media preferences. I have shown that people assess their informedness not only in absolute, but also in relative terms. This feeling *sufficiently* informed is largely detached from actual knowledge. Therefore, particularly if an issue is seen as important, the self-assessed knowledge indicator is not a valid measure of people's information states (Czesnik, 2003). However, from the divergence patterns between knowledge quizzes and self-reports, one can derive valuable information about people's information *needs*. These subjective desires to learn more play a crucial role in explaining media behavior. People choose to use information sources not simply because they lack certain information, but because they desire that information. To what extent this happens depends mainly on the relevance attributed to an issue. Relevance, however, is domain-specific (Matthes, 2006). Thus, the need for information as an explanatory variable should be used to account for the use of media *for specific tasks* only. To explain *general* media use, information needs are much less suitable, for they can hardly be generalized.

The other main finding concerns the quality of information needs. As I have shown, media preferences shift with higher knowledge. The different preferred sources correspond to specific kinds of information, which are provided more or less prominently in each media channel. Once needs exceed habitual media use, people strategically choose media they expect to satisfy their information needs best. They tend to report display media preferences when the goal is orientation, and prefer research media when they want to retrieve specific information. Also, one can distinguish whether people seek factual output-oriented information or process-oriented background information. What kind of information is needed depends mainly on actual knowledge:

The findings support the idea that learning proceeds from orientation, via the acquisition of factual knowledge and the discovery of processes underlying these facts, towards the acquisition of background knowledge. Interest is also conducive for process-orientation, which requires higher skills and motivation (Garramone & Atkin, 1986). Building on these relationships, we can infer information needs beyond merely describing information behavior (see van de Wijngaert, 1999).

Relating these findings to communication research, some implications can be sketched out. First of all, the dependency on relevance attribution renders information needs potentially unstable. Issues relevant in one situation may be ignored in another, since one can impossibly assess (let alone address) all one's knowledge gaps at a time (Dervin & Nilan, 1986). Specific goals and context factors may render different aspects of information salient, and thus shift relevance attributions. Framing effects and situational schemas may thus lead people to perceive different needs, even though their actual knowledge is unchanged (Chew, 1994). Needs can be expected to persist only as far as relevance attributions are stable – e.g., if they are externally constrained because of professional tasks (Vakkari, Savolainen, & Dervin, 1997). This questions the tenability of the trait-like treatment of information needs in many U&G applications (Atkin, 1985). Also, it explains why people often do not use information that they asked for. As far as the method of inquiry leads people to attribute relevance to knowledge gaps they normally disregard, such results may overstate demands considerably.

Although one may not be able to predict whether the strength of information needs will persist over time, however, the direction of needs can be forecast. Different individuals, who can be identified from their knowledge and education levels, tend to seek specific kinds of information from the media (Chew, 1994). What is more, they are likely to use the same information differently, focusing on items that relate to their specific needs (Ottati & Wyer, 1990; Neuman, Just, & Crigler, 1992).

These findings also relate to the debate on the European public sphere. As far as the claimed communication deficit stems from a lack of process-oriented information, the analyzed

data show that the problem goes beyond media coverage. Only a limited, relatively knowledgeable group appears to value background information on European politics at all (Instytut Spraw Publicznych, 2001). Unless people perceive a need for deeper knowledge on that issue, they are likely to disregard such information even if it were available.

Summing up, I have argued that existing survey measures can be used to assess both the size, and the quality of people's information needs. How much information people desire depends more on attributed relevance than on knowledge. At the same time, people seek distinguishably different information, in different media, depending on their knowledge levels. One might object that these findings only reflect known differences in the media use patterns of educational groups. However, this criticism misses the mark. Rather, my paper might explain *why* these groups use different media. In that view, certain sources are simply more tailored to their specific information needs.

Another objection concerns the influence of citizenship duty on information needs. As argued above, I chose the EU context precisely to avoid the influence of strong citizenship norms. Two tests yielded no support for the citizenship duty explanation: Respondents justifying their voting behavior on these grounds did not show significantly higher information demands. Also, only people with relatively high knowledge exhibited a preference for process-oriented information. If a feeling of duty were responsible, process-oriented information demand should have been less dependent on (high) knowledge. On these grounds, it is safe to momentarily disregard this alternative explanation.

Aside the diminished role of citizenship norms, the specifics of the European test case should not represent much of a limitation. There is no reason to expect fundamentally different dynamics in a national setting. The main difference should be less variation on the relevance attribution scale. Another difference might be that people need to deviate less from media habits to find information, due to broader provision. Both effects complicate the empirical analysis, but should not affect the kind of investigated connections.

The most relevant objection to the reported findings is the small size of most effects. As cautioned above, some responsibility may be attributed to the quality of data – crude indicators, low variance, large number of zero-codes, etc. Even with perfect data, however, the modeled relationships do not claim to account for all variation in media preferences and information demands. Habits dampen the importance of strategic media choice. Other influences have been entirely neglected here, for they can hardly be captured in surveys: Situational effects, priming and framing affect relevance attributions and derived needs. Media use cultures may guide people's searches toward different sources. Peoples' subjective expectations regarding anticipated media content remain to a large degree inaccessible. The only approximate correspondence of media with information types leaves open large spaces for unexplained deviations. This is to a certain degree unavoidable simply because texts contain all kinds of information, even if some are made more salient.

Last, and most relevantly, the perceived knowledge indicator itself remains a source of noise. As the analysis reveals, it reflects at least two quite different considerations. One element represents a realistic self-assessment of knowledge. This aspect comes to bear stronger if the issue-matter is considered as remote or irrelevant. A second component reflects the desired state of knowledge, which shows up in the negative link with information demand. This component of perceived knowledge changes both in weight and quality with stronger involvement. People value information differently depending on their previous understanding and perceived importance of an issue. They feel satisfied at different knowledge levels, which they also reflect in their reported self-assessment. The perceived knowledge indicator thus represents a product of rather complex cognitive processes. These are theoretically distinguishable, but can hardly be operationalized separately. Seen in that light, large effects would have been rather surprising. The robust, significant findings suggest that at least the core features of the explored relationships have been captured reasonably well. Based on this conceptualization one can now develop more detailed predictions, and aim for refined data.

The described relations provide a theoretical bridge between U&G theory and cognitive states. As far as the bridge holds, information needs can strengthen explanations of media choice by rooting them in psychological theories. More substantiation is needed particularly on the cognitive side of the gap: Under what conditions do people identify knowledge as "missing"? How is knowledge assessed, and how is it accessed? How does new information integrate into existing knowledge? Further research is thus needed. Still, interpreting people's information demands is by no means as futile as the paradoxa at the beginning suggested. We need to acknowledge that media users are cognitively constrained, strategic actors, weighing options and pursuing their own agendas. If we accept this, it is possible to derive considerably more information from and about the need for more information.

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Table 1

Different Kinds of Information Needs

Orientation of knowledge / Use of knowledge	Political output	Political process
Relevance assessment	[I] e.g., *If policy X becomes real, is this likely to affect me enough so I should understand it?*	[III] e.g. *Is there anything about the process behind policy X that I should consider before forming an opinion/acting on it?*
Knowledge acquisition	[II] e.g., *What will change if policy X is adopted? What affects me, and how? What new opportunities are in it for me?*	[IV] e.g., *What is the intention pursued in creating policy X? What options were debated? Who is responsible for decisions I (dis)agree with?*

Table 2

Regressions Predicting Perceived Knowledge by Actual Knowledge

Model	1			2			3			4		
Range	Whole sample			Subsamples by level of relevance attribution								
Variable				Low			Medium			High		
	B	*SEB*	β	*B*	*SEB*	β	*B*	*SEB*	β	*B*	*SEB*	β
ak [a]	.892	.022	.308***	1.26	.055	.410***	.987	.029	.357***	.972	.038	.336***
ak² [a]	-.201	.030	-.053***				-.186	.039	-.050***			
ra [a]	.870	.017	.390***									
ra*ak [a]	.166	.024	.055***									
Adj. R²	.363			.168			.127			.113		
N	16071			2762			8266			5065		

Note. ***$p < .001$.

[a] ak = actual knowledge; ak^2 = ak squared; ra = relevance attribution.

Table 3

Regressions Predicting Total Information Demand from Perceived Knowledge

Variable	Uncontrolled models						Full model		
	Model 1			Model 2					
	B	*SEB*	β	*B*	*SEB*	β	*B*	*SEB*	β
pk [a]	-.021	.001	-.175***	-.015	.001	-.123***	-.011	.001	-.090***
ak [a]				-.037	.003	-.104***	-.022	.003	-.064***
ra [a]									*ns*
education							-.002	.001	-.030**
age							.005	.001	.036***
gender									*ns*
citizenship duty									*ns*
use television									*ns*
use radio							-.061	.006	-.088***
use newspaper							-.038	.006	-.057***
Adj. R²	.031			.039			.053		
N	16071			16071			16071		

Note. $^{**}p < .005$; $^{***}p < .001$.

[a] pk = perceived knowledge; ak = actual knowledge; ra = relevance attribution.

Table 4

Association of Information Demand Orientations Towards Specific Media Channels with Knowledge and Relevance Attribution

Variable	Association coefficients of knowledge, relevance attribution, and controls with the degree of orientation of information demand towards:									
	Television		Radio		Newspapers		Magazines		Online	
	R	η^2	*R*	η^2	*R*	η^2	*R*	η^2	*R*	η^2
ak [a]	-.022	.018	.017	.020	-.024	.021	.013	.022	.117	.028
pk [a]	-.028	.016	.022	.018	-.008	.018	.029	.020	.122	.026
ra [a]	-.008	.024	.017	.027	-.018	.027	.004	.029	.095	.029
Σ id [a]	.146	.109	-.037	.091	.052	.085	-.308	.173	-.678	.477
education	-.012	.010	.021	.010	-.001	.010	.034	.011	.060	.014
gender	.009	.001	-.003	.001	.012	.002	-.009	.002	-.035	.002
age	.019	.002	-.024	.002	-.023	.002	-.018	.002	-.019	.002
europ. [a]	-.025	.004	.025	.005	-.012	.004	.010	.004	.044	.005
use televis. [a]	-.019	.003	.012	.004	-.003	.005	.010	.004	.040	.004
use radio	-.012	.016	.032	.018	-.053	.024	.020	.020	.117	.024
use newsp. [a]	-.013	.007	-.075	.017	.004	.010	.032	.011	.086	.012

Note. All correlation coefficients are significant at $p < .001$ level.

[a] ak = actual knowledge; pk = perceived knowledge; ra = relevance attribution; Σ id = total information demand; europ. = European identification; televis. = television; newsp. = newspapers

Table 5

Mean Knowledge Levels of Groups Demanding Less, Unchanged, or More Information from Specific Media Channels

Information demanded from medium		Mean actual knowledge of groups with different demand orientations: Television	Radio	Newspapers	Magazines	Online
Less	*M*	1.4119	1.3926	1.4157	1.3997	1.2897
	SD	.6771	.6904	.6910	.6949	.6971
	N	4825	4228	5075	4324	2808
Unchanged	*M*	1.2057	1.1974	1.1912	1.1892	1.1979
	SD	.7239	.7221	.7250	.7217	.7201
	N	6757	6788	6502	6645	6925
More	*M*	1.3766	1.4091	1.3817	1.4082	1.4551
	SD	.6905	.6771	.6712	.6724	.6718
	N	4489	5055	4494	5102	6338
Whole sample	*M*	1.3153				
	SD	.7071				
	N	16071				

Note. The scale for actual knowledge ranges from 0 (no knowledge) to 3 (high knowledge).

Figure 1

Estimations of Perceived from Actual Knowledge

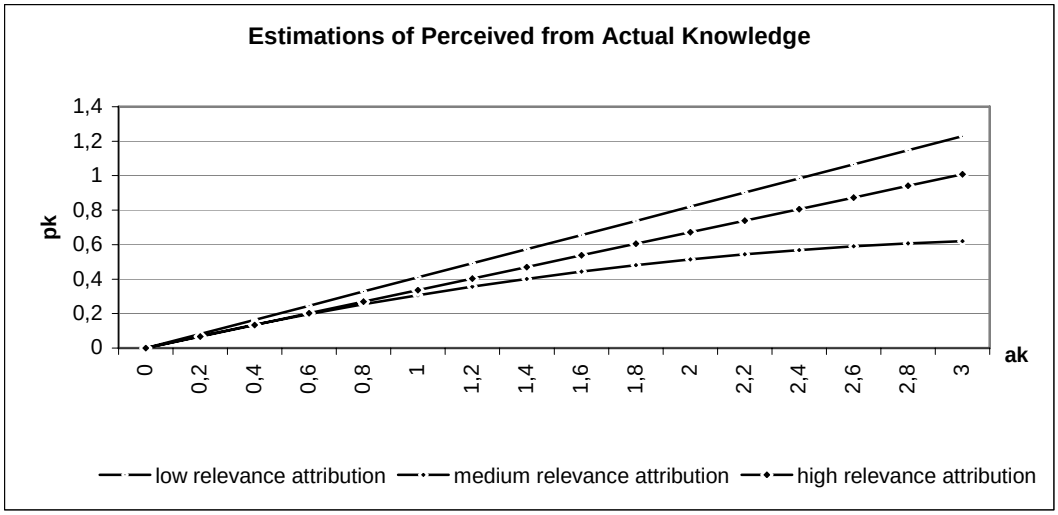
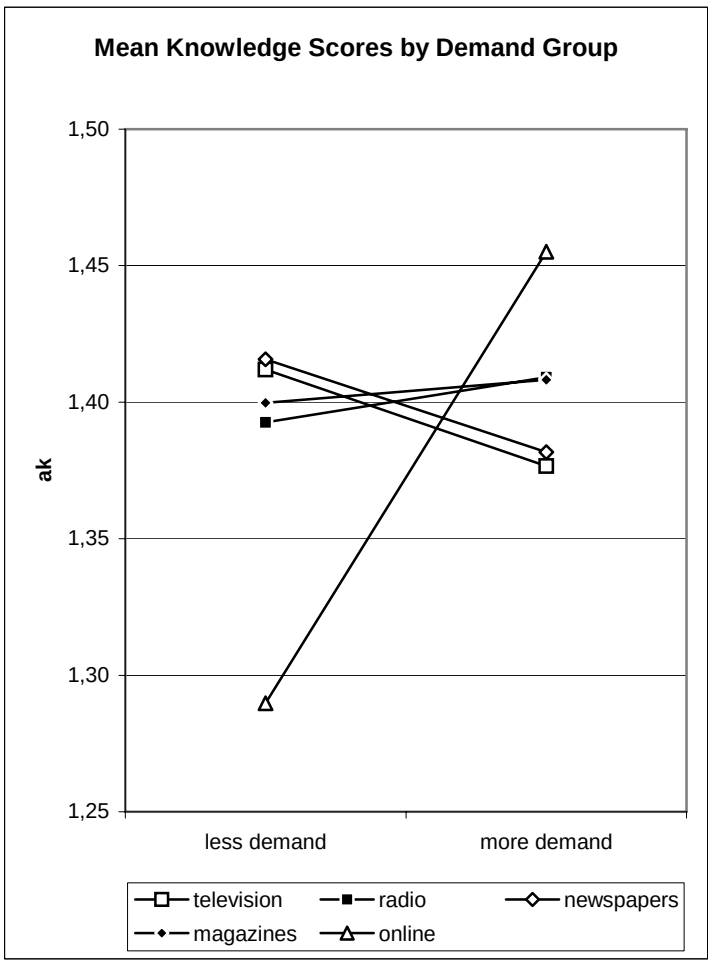


Figure 2

Mean Knowledge Scores by Demand Group



[1] Aside these treatments of information needs, there is also an extensive debate on citizenship knowledge needs. Summed up, this body of literature discusses what knowledge citizens ought to have in order to make reasonably rational voting decisions, or to be good citizens (e.g., Delli Carpini & Keeter, 1996). This debate is not considered here, because it treats needs from a normative, or functional, universalistic perspective. This is irreconcilable with the user-centred approach required to understand subjective information needs.

[2] People often follow up on information encountered accidentally. They then continue searching other sources for further information (e.g., Tewksbury, 2003; Williamson, 1998; Savolainen, 1999).

[3] This association can be read both as a media effect (information hides or exposes influenceability) and as strategic use (adaptation requires different knowledge than participation). A third motive for the search for political information, as found in a survey by Instytut Spraw Publicznych (2001), referred to citizenship duty. I will thus also explore this alternative explanation for citizens' claimed information needs below.

[4] Social desirability/citizenship duty, as a rival explanation of information demands, suggests the opposite order. In this perspective, people should focus on political process, downplaying the "egoistic" output-oriented aspects.

[5] The anticipation of media content implicitly underlies most U&G approaches, as well as theories of selective exposure. Without anticipatory knowledge, selective exposure would be coincidental and meaningless.

[6] Formats "dedicated to European politics" were treated as focusing more on process; those "targeted at specific groups" referred more to output information. The presented conclusions rest on my own calculations from the published aggregate tables. Details can be obtained from the author.

[7] Thus, it matters what magazines people have in mind when stating their media preferences. In a perceivably politically oriented survey, respondents are most likely to associate political rather than consumer magazines.

[8] ca. 500 Luxembourgians, 1000 from every other EU country, plus 1000 East Germans and 300 Northern Irish

[9] For instance, having received no information on the Euro at all implies no information from any channel. Thus, "inapplicable" codes could be recoded as "source not mentioned". Quizzes answered DK were treated as wrong answers. All analyses were conducted on both the non-recoded and the recoded data set and compared subsequently. Most detected changes were due to the lower number of complete cases.

[10] Q17: "Using this scale, how much do you feel you know about the European Union, its policies, its institutions?"

[11] People were asked (in a closed format) which EU institutions they were aware of (also including less well-known ones such as the Council of Regions and the Court of Auditors; Q26). One quiz asked for the names of the EU Commission president and (one of) the respective country's commissioner(s) (Q44); the other quiz asked for the conversion rate of the national to the common currency, some key dates and the modalities of the changeover (Q54-58). Correlation tests from this composite indicator suggest sufficient reliability.

[12] For a discussion of indirect measures of information needs via relevance and (un)certainty see Matthes, 2005.

[13] The questions were: "In general, do you pay attention to news about each of the following: […] 1. Politics […] 3. The European Union" (Q16), and "Personally, would you say that the single European Currency, the euro, is a topic that you are interested in, fairly interested in, not very interested in, or not at all interested in?" (Q53).

[14] Measured asking, "When you are looking for information about the European Union, its policies, its institutions, which of the following sources do you use?" (Q18).

[15] These indicators suffer from low variation. As a difference score between two binary measures, it shows only three categories. Between 70.2% (television) and 92.7% (online) entries are coded zero. Respondents tend to name only few preferred and used sources, which inflates the number of zero codes. Still, the indicators are theoretically and practically stronger than each individual measure.

[16] For this, each demand measure was recoded into 1 (*demanded less*), 2 (*no change*), and 3 (*demanded more*). The relative demand-orientation toward a medium was then calculated as the demand in one medium divided by the sum of all demands by that respondent: $rid_{M,j} = id'_{M,j} / (id'_{M,j} + id'_{N,j} + id'_{O,j} + id'_{P,j} + id'_{Q,j})$

[17] These are: (age when finishing) education, gender, age (in 6 groups), and identification with the EU (Q9).

[18] "What were the two main reasons why you voted in the European Parliament elections? […] b) I consider voting a civic duty and vote in every election, be it local, national, or European." (Q42).

[19] This is partly an effect of the spontaneous response items in the questionnaire. Most respondents mentioned only few used and preferred media. Aside validly measuring low media use or preference, this may also reflect disinterest in the survey. The same applies to the actual knowledge measure, because the underlying quiz items require respondents to consider rather than choosing DK. However, other surveys have shown that those indifferent on political issues indeed seem have lower knowledge (Instytut Spraw Publicznych, 2001).

[20] Only those using a medium can score negatively on that indicator. Therefore, it may to a degree also reflect media use habits. However, zero-order-correlations of media use measures and the *id* indicators are rather low and negative, radio being the largest at -.133. Schönbach (1983, p. 106) mentions same caution, and also finds little support for the theoretical worries in his data.