

## **Online health information and patient decision making styles: A new segment of patient**

Research shows online health information has a considerable effect on patient decision making. This research systematically investigates and measure distinct patient decision making styles that involve practitioners and are associated with online health information. This study identifies and test three patient decision making styles: (1) cooperative, (2) oppositional and (3) autonomous; which further served as base for four unique patient segments/typologies. This study contributes to knowledge pertaining the role of consumer cocreation in the healthcare domain, and despite the rhetoric around patient empowerment, shows that not all patients are willing partners in health service consumption. The typology presents a practice-relevant framework for differentiating addressable patient segments, and provides a sound base for designing more effective healthcare offerings for today's internet-informed patients.

*Key words: online information, decision making style, patient, health care practitioner cocreation*

*Track: Services Marketing*

## 1. Introduction

Traditionally, service providers created value for customers through specialized knowledge and skills (Vargo, Maglio, and Akaka 2008). However, changes in the technological landscape mean consumers now are able to access much of the expert knowledge previously held solely by service providers. This accessibility has dramatically altered customers' decision making: customers now commonly decide on routes and airfares then request the travel agent to book those (Standing, Tang-Taye, and Boyer 2014), or use online accounting tools and avoid the accountant altogether (Dimitriu & Matei, 2014).

The accessibility of formerly protected information impacts the health care industry significantly. Today, more people seek information online before interacting with health care providers (Fox and Duggan 2013). This trend is in part driving the paradigm change from viewing patients as passive recipients of health care to active participants in the management of their own health, as well as changing the traditional dyadic health care service encounter (Robertson, Polonsky, and McQuilken, 2014). Researchers identify decision making as a particular interactional process considerably affected by patient-sourced online health information (Essén et al., 2016). Of course, searching for online health information that is then used as a resource to inform interactions with clinicians is an example of value cocreation, defined as "benefit realized from integration of resources through activities and interactions with collaborators in the customer's service network" (McColl-Kennedy et al., 2012, p. 384).

Some research finds patients use the information obtained online in deliberations with the practitioner before arriving at a mutual decision about treatment and collaborating in the management of the patient's health condition. Other studies show patients might choose to make decisions independently of practitioners when they perceive online health information provides sufficient information and there is no need to consult a health care practitioner, while others use it during interactions to challenge the opinions or recommendations of their practitioners (Fox & Rainie 2002, Lupton & Jutel 2015, Essén et al., 2016). Clearly, then, patients vary in the ways in which they use online health information to create, and cocreate, value.

While there is scattered evidence of the variable effects of online health information on decision making in relation to the health professional, no research has systematically identified, conceptualized, and measured the basic customer decision making styles associated with patient use of online information. Further, to our knowledge, no research has yet profiled patient segments based on these decision making styles in relation to interactions with their health care practitioners. Therefore, the over-arching aim of this research is to investigate patient decision making styles in relation to health professionals associated with use of online information.

Recognized as an ethical imperative in terms of respect for patient preferences, values, and circumstances, and as a means to better manage scarce health care resources, patient decision making is regarded as a critical process because of its consequences, ranging from patient health outcomes to health care costs (e.g., Townsend et al., 2015). Better understanding of patient's decision making style and identifying relevant segments on the basis of differences in these styles would provide health professionals and policy-makers with an empirically validated foundation for more effectively and efficiently addressing customer needs and preferences. Hence, in this research we ask: 1. After accessing online health information, what are the different decision making styles and interactions with health care practitioners? 2. How can we measure various decision making styles? 3. How can we segment and profile patients based on their decision making styles?

To answer these questions, this study first -based on previous literatures- identifies and proposes following patient decision making styles in relation to their interactions with health professionals of patients who seek online health information: *cooperative* (i.e., Essén et al., 2016), *autonomous* (i.e., Lupton & Jutel 2015), and *oppositional* (i.e., McMullan 2006). In the next section (Method) this study empirically investigates the aforementioned decision making styles and further uses them as a base for unique patient segments.

## 2. Method

The first step empirically tested the proposed patient decision making styles associated with online information seeking (cooperative, autonomous, and oppositional). Based on data from focus groups (3 groups of 6 participants each), semi-structured in-depth interviews (8 participants), and a 28-question pilot survey (159 useable responses), combined with items developed from the literature, 22 items were generated relating to patient online health information and decision making involving the health care practitioner. Authors and faculty members rated how well each of the items related to the decision making styles defined as:

(1) Cooperative: The patient uses online health information to cooperate with the health professional and work as an active partner in making decisions about treatment and management.

(2) Autonomous: The patient uses online health information to make autonomous decisions without involving the health care practitioner.

(3) Oppositional: The patient draws on online information to assert their own preferences for treatment/management and oppose practitioner advice in decision making.

Redundancies were then eliminated resulted in the retention of 10 items: three Cooperative items, three Autonomous items, and four Oppositional items. In a next step, a questionnaire was distributing to Baby Boomers in New Zealand (N=276), the United Kingdom (N=407) and the United States (N= 313) asking respondents to rate how the health information they found online has changed specific health decisions using the 10 items. Explorative factor analysis supported the three fundamental decision making styles. Based on split loadings and reliability analysis two items were eliminated. The total variance extracted by the three factors was 72 per cent, the Bartlett's test of sphericity was significant with  $p < 0.01$  and the Kaiser-Meyer-Olkin measure was 0.78. The Cronbach's  $\alpha$  of the remaining items for the three relationship dimensions were of an acceptable standard for the study's item structure (cooperative<sup>1</sup>  $\alpha = 0.77$ , autonomous<sup>2</sup>  $\alpha = 0.687$ , oppositional<sup>3</sup>  $\alpha = 0.774$ ). A confirmatory factor analysis (CFA) of the remaining 8 items testing for convergent and discriminant validity, indicates the three measurements models provide a good model fit ( $\chi^2 = 120.82$ , df =15,  $p = 0.00$ , GFI = .97, CFI = .96 NFI = .95 and TLI = .92). Factor loadings of all items in the model are higher than 0.6. Average variance extracted (AVE) is greater than 0.5 and compositional reliability (CR) is above 0.6. Together, AVE and CR satisfy the requirement for convergent validity. Finally, AVEs are higher than the squared correlations between constructs, thus supporting the discriminate validity of the model.

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<sup>1</sup> I have used online health information to ask questions of my health professional(s); I have had my diagnosis confirmed by my health professional; I have sought help from a health professional

<sup>2</sup> I have tried to treat a health condition or disease without help from a health professional; I have tried to diagnose a health condition or disease I or someone else might have

<sup>3</sup> I have changed the treatment recommended by a health professional; I have refused or discontinued treatment recommended by my health professional' I have changed from one health professional to another; I have sought a second opinion from another health professional

Table 1. Final Cluster solution, ANOVA results

	Whole Sample		Cluster 1 Cooperative		Cluster 2 Autonomous-Cooperators		Cluster 3 Oppositional-Cooperators		Cluster 4 Unaffected		F value	Sig.
	M	SD	M	SD	M	SD	M	SD	M	SD		
Cooperative	3.17	0.94	3.7	0.55	3.5	0.65	3.82	0.59	1.99	0.55	494.107	.000
Autonomous	2.61	1.00	1.98	0.65	3.56	0.56	2.28	0.62	1.96	0.79	435.242	.000
Oppositional	2.2	0.84	1.66	0.46	2.64	0.75	3.13	0.57	1.63	0.52	287.477	.000
Cluster Size			229		385		111		271			
Percentage of respondents			23%		38 %		11 %		27%			

Notes: All cluster means are significant at the .001 level. 83% of the pairwise comparison is significant at the  $p < 0.05$  level showing the four clusters obtained using the patient decision making styles are unique and stable. All variables are coded on a five-point scale, with 1 for “strongly disagree” to 5 for “strongly agree”.

Next, Cluster analysis of respondents’ ratings of items for the three patient decision making styles was used to identify homogenous patient groups. A hierarchical procedure (Ward’s method) was used suggesting a four-cluster solution. Next, a K-means clustering analysis for the four-cluster solution was performed. Based on the three patient decision making styles, the four patient subgroups obtained from the current study were identified (see Table 1 for details). Other practice-relevant variables, including living with chronic health problems; eHealth literacy; and frequency of health care practitioner visits as well as descriptive demographic variables completed the cluster description:

*Cluster 1: The Cooperators:* This group describes 22.99% of respondents, making it the third largest of the four clusters. Patients in this cluster are likely to use the cooperative decision making style and, according to the literature, collaborate with their practitioners in joint decision making. They are actively seeking help from health care professionals, they use online health information to ask questions in interactions with their practitioners, and they have diagnoses they have made themselves confirmed by a professional. They are highly cooperative in relation to health care practitioners. They have moderate levels of eHealth literacy. They are also more likely to be living with a chronic health problem and visit their health care practitioner more often. This cluster is not dominated by any particular nationality, with US citizens representing 34.9%, UK 31.9%, and NZ 33.2%. Patients here are most likely to be retired and receiving government welfare (e.g., pension). This cluster, which has the largest number of widowed respondents, includes a reasonable cross-section of ages across the baby boomer cohort.

*Cluster 2: The Autonomous-Cooperators:* This group, the largest at 38%, is made up of patients who exhibit both cooperative and autonomous behaviors in their decision making with health care practitioners. Patients in this cluster use cooperative and autonomous decision making styles; thus, at times they make decisions in collaboration with practitioners and at other times they make decisions independently of health care practitioners. This research shows patients who use both autonomous and cooperative decision making styles in their interactions with health care practitioners are highly eHealth literate. They are neither more nor less likely to be living with a chronic health problem and they make a moderate number of visits to their health care practitioners. This Autonomous-Cooperator cluster is comprised mainly of UK citizens; with 49.1% of respondents, this is the largest percentage of any nationality in the research, while NZ (21%) and US (29.9%) respondents represent significantly smaller national groups in the cluster. Cluster 2 patients are most likely to be employed full time or part time and to have never been married. This cluster is made up predominantly of patients born 1960-1964, the Fourth Wave and youngest of the baby boomer generation.

*Cluster 3: The Oppositional-Cooperators:* This group of patients is the smallest, accounting for 11.14% of the sample. These patients are characterized by their high level of

both cooperative and oppositional decision making with practitioners. Data analysis added the following empirical detail to the profile of Oppositional-Cooperators: patients are highly eHealth literate, more likely to be chronically ill and to have a relatively high number of visits to their health care practitioners. Results show they are the oldest of the baby boomer cohort (i.e., First Wave boomers born 1946-1949), and are unemployed, widowed or permanently separated, and mostly US citizens (43.2%)

*Cluster 4: The Unaffected:* This cluster, the second largest group comprising 27.2% of respondents, comprises patients who typically are neither cooperative nor assertive with health care practitioners in their decision making, nor do they exhibit autonomous behavior. Data show these patients are less likely to have chronic health problems, they have low eHealth literacy, and they do not visit their health care practitioners often. In terms of demographical variables, Cluster 4 patients are most likely Third Wave boomers born between 1955-1959, retired, in a dissolved union or never married. This cluster is dominated by UK patients (42.8%).

Interestingly, in both the Cooperator and the Oppositional-Cooperator cluster report chronic health problems. In addition, patients in both clusters make more visits to their health care practitioners. Yet, the Oppositional-Cooperator is significantly more eHealth literate than the Cooperator, suggesting a link between eHealth literacy and more assertive and oppositional patient behavior toward health care practitioners (as behavioral dimensions of patient empowerment). For relatively healthy people, high eHealth literacy is linked with being both autonomous and co-operative, and with a medium number of practitioner visits. In contrast, healthy patients with lower levels of eHealth literacy are unaffected by online health information and have low frequency of visits to health care practitioners. Finally, it is noteworthy that all of the respondents who use online health information in their decision making with health care professionals, also are characteristically cooperative to some degree. In other words, for the 72% of respondents in these three segments, cooperation with their practitioners is part of their consumer behavior.

### **3. Conclusions and Implications**

This study uncovers the decision making processes of patients, in particular those who seek online health information. More specifically, the research identifies three decision making styles relative to health professionals: oppositional, co-operative, and autonomous. Further, based on those decision making styles patients can be segmented into four distinct clusters: the Cooperators, the Autonomous-Cooperators, the Oppositional-Cooperators, and the Unaffected. The major empirical contributions of this study include the fundamental decision making styles involving online health information identified in the literature and the identification and profiling of the 4 patient segments developed on the basis of their decision making relative to health professionals. This study answers recent calls for more research into three interrelated domains: value creation and cocreation (Anderson and Ostrom 2015), cocreation in health care (Danaher & Gallen, 2016), and TSR (Anderson et al., 2013). Specifically, this study shows that even among samples of consumers who have recently used the internet to access health information, and hence demonstrate value creation through their own efforts, there is a great deal of variation in the levels of cocreation of value the different segments exhibit. From a TSR perspective, previous research suggests online health care support impacts quality-of-life (Yao, Zheng, and Fan, 2015). Likewise, patients who are health literate, active in managing their own health, and view their doctors as partners, have higher levels of life satisfaction which can therefore lead to improvements in well-being for entire communities (Rahtz & Szykman 2008; Sweeney, Danaher, and McColl-Kennedy, 2015). Hence our research, which focuses on the roles of consumers, service providers, and

technology for value creation contributes to the second most important area among the 80 research areas identified by the research-priority setting work by Ostrom et al. (2015).

Patients in the Cooperator segment are influenced by online health information to seek professional help. Although a lower than average number of Cooperators live with chronic health problems they visit their health professionals more often. Patients in the Cooperator segment are moderately eHealth literate, compared with Autonomous-Cooperators and Oppositional Cooperators (both segments highly eHealth literate), and Unaffected (low eHealth literacy). More research could further investigate the relationships between chronic health problems, visits to the GP, and eHealth literacy. It is possible raising the eHealth literacy of patients in the Cooperators segment would enable more self-responsibility and thereby reduce over-dependence on health professionals and unnecessary visits to those practitioners. At a time when joint decision making and self-responsible/self-managing patients are seen as key to reducing the costs of health care service provision, Autonomous-Cooperators are clearly a desirable segment. Certainly, their cooperative behavior is likely to make this segment efficient for health professionals to serve: these patients are likely to be easy and fast to work with, so emotional labor costs for the practitioner will be minimal. Therefore, from the perspective of health care policy-makers, this segment will impose the least financial cost on the health care system. The Oppositional-Cooperator segment comprises patients who will be both oppositional and cooperative in decision making with practitioners. Priorities for the Oppositional-Cooperator segment include ensuring these patients have access to high quality health information and that they maintain high eHealth literacy. These strategies could reduce the potential for this segment to be misinformed, leading to confrontational interactions and decision making in the context of the patient-practitioner relationship; thus avoiding the possibilities of adverse health effects for the patient and customer-switching for the practitioner. Health professionals could also be trained in managing interactions with these patients so the online health information they share with practitioners is discussed and considered in a respectful open dynamic. Patients in the Unaffected segment characteristically are not significantly influenced by online health information in the decisions they make relative to health professionals. Further, patients in this segment visit their health professionals the least frequently of all four segments in the typology. This segment could be regarded as a risk group because, coupled with the negligible impact of internet-accessed health information, the low number of health professional visits means there is the risk serious conditions are undetected. Given the low influence of online health information on the decision making of this sizeable segment, policy-makers and practitioners urgently need to identify those communication channels most effective in reaching and supporting these patients.

In conclusion, this research demonstrates complex differences regarding the online health information, decision making, and interactional behaviors of patient. Close investigation of the variations in characteristics showed that according to their decision making style, patients experience differences in the way online health information impacts their interactions with health professionals. The patient typology presented provides a sophisticated framework for distinguishing practice-relevant and addressable segments of patients. Understanding these segments will enable practitioners and policy-makers to implement health care communication programs that are meaningful and valued by different groups of patients. The increased effectiveness and efficiencies of better health care offerings will, in turn, address some of the economic issues healthcare services and systems face in meeting the needs of today's internet-informed patients. Only by examining the roles health customers play in value creation and cocreation can we better understand how to build transformative health services that contribute to societal well-being.

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