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Erstveröffentlichung in / First published in:

Medical decision making. 2015, 35(4), S. 525 – 532 [Zugriff am: 19.08.2019]. SAGE journals. ISSN 1552-681X.

DOI: <https://doi.org/10.1177/0272989X15575518>

Diese Version ist verfügbar / This version is available on:

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Adapting Scott and Bruce's General Decision-Making Style Inventory to Patient Decision Making in Provider Choice

Sophia Fischer, Katja Soye, PhD, Sebastian Gurtner, PhD

Objective. Research testing the concept of decision-making styles in specific contexts such as health care-related choices is missing. Therefore, we examine the contextuality of Scott and Bruce's (1995) General Decision-Making Style Inventory with respect to patient choice situations. **Methods.** Scott and Bruce's scale was adapted for use as a patient decision-making style inventory. In total, 388 German patients who underwent elective joint surgery responded to a questionnaire about their provider choice. Confirmatory factor analyses within 2 independent samples assessed factorial structure, reliability, and validity of the scale. **Results.** The final 4-dimensional, 13-item patient decision-making style inventory showed satisfactory

psychometric properties. Data analyses supported reliability and construct validity. Besides the intuitive, dependent, and avoidant style, a new subdimension, called "comparative" decision-making style, emerged that originated from the rational dimension of the general model. **Conclusions.** This research provides evidence for the contextuality of decision-making style to specific choice situations. Using a limited set of indicators, this report proposes the patient decision-making style inventory as valid and feasible tool to assess patients' decision propensities. **Key words:** decision-making style; patient choice; scale development and adaption. (*Med Decis Making* 2015;35:525–532)

Originating in cognitive psychology, decision-making style is "a habit-based propensity to react in a certain way in a specific decision context."^{1(p820)} Although many constructs exist that identify individual differences in decision making,² Scott and Bruce's¹ General Decision-Making Style concept and inventory is the most encompassing,

validated, and widely used conceptual approach.^{3,4} It measures *rationality* and *intuitiveness* as well as 3 complementary styles: *avoidance*, *dependence*, and *spontaneity* (see Table 1). From a conceptual perspective, these dimensions are independent but not mutually exclusive.^{1,4}

Cognitive scientists generally believe that "rational" or "intuitive" decision-making styles lead to improved life decision outcomes, whereas "avoidant" and "spontaneous" decision-making styles affect them negatively. "Dependent" decision making, on the other hand, has not proven to be related to decision outcomes.^{5–10} The aim of this report is twofold: first, we want to assess the contextuality of the concept of general decision-making styles and the respective inventory by Scott and Bruce¹ within the specific realm of health care. Second, we seek to create an initial framework for a measurement tool that provides behavioral insights into patient decision making.

The original inventory consists of 25 items with 5 indicators per style. Many prior studies confirmed the inventory's factorial structure and demonstrated evidence for the scale's reliability and validity when applied to general decision making.^{6,11–13} Although the definition of decision-making style refers to "specific" decision contexts, research has

Received 27 March 2014 from the Research Group InnoTech4Health, Department of Business and Economics, Technische Universität Dresden, Germany (SF); University of Cooperative Education Riesa, Germany (KS); and Institute of Radiation Oncology, Helmholtz-Zentrum Dresden-Rossendorf, Germany (SG). Financial support for this study was provided in part by a grant from the European Social Fund and the Free State of Saxony, Germany. The funding agreement ensured the authors' independence in designing the study, interpreting the data, writing, and publishing the report. Revision accepted for publication 6 February 2015.

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DOI: 10.1177/0272989X15575518

Table 1 Description of General Decision-Making Styles

Core decision process	
Rational	- Thorough search for information and logical evaluation of optional alternatives - Analytic, sequential information processing and systematic appraisal
Intuitive	- Strong reliance on emotions, presentiments, hunches, and gut feelings - Simultaneous information processing
Spontaneous	- Sense of immediacy and desire to finish the decision process as quick as possible
Decision-regulatory process	
Dependent	- Extensive advice seeking, consulting, and directions from relevant others
Avoidant	- Attempt to escape the choice situation and thereby avoid or delay the decision

Note: Descriptions above are derived from Scott and Bruce¹ and Dewberry et al.³⁴ The latter propose to cluster dependent and avoidant types as regulatory decision process styles, whereas rational, intuitive, and spontaneous decision-making styles describe the way individuals make choices per se.

hardly ever tested Scott and Bruce's¹ general model and inventory in distinct choice situations.

Scott and Bruce's decision-making styles are particularly applicable to patient choice. In this study, we consider a patient's choice of a provider for future elective treatment (i.e., nonemergent care). Within this specific decision context, situational factors, such as information asymmetries,¹⁴ uncertainty, or emotional stress,¹⁵ limit the patient's ability to act as rational decision maker. In addition, persons confronted with decisions under uncertainty often apply heuristic decision patterns to reduce task complexity.^{16,17} Despite this knowledge, provider choice research is dominated by traditional economic theories regarding patients as utility maximizers (e.g., Jung et al.¹⁸). Based on this debate, *rationality* and *intuitiveness* are core dimensions of decision processes that should be considered within the patient choice context. Moreover, *dependence* on others plays a vital role as health care professionals and social networks strongly support the patient's choice.^{19,20} Likewise, research shows that not every person is open to deliberate, self-empowered decision making.²¹ Situations requiring health care may also be accompanied by negative emotions or feelings that lead to *avoidance* in provider choice situations. Therefore, the rational, intuitive, dependent, and avoidant dimensions of Scott and Bruce's General Decision-Making Style Inventory¹ are highly relevant to the health care domain. We excluded the spontaneous style because patients in our study needed to wait several weeks before making their choices, and thus they could not act upon a sudden impulse at the time the decision situation became obvious.

METHODS

Context-Specific Adaption and Pretest

To apply the style dimensions to health care, the items needed contextual adaptation. In an initial

step, all 20 relevant items from the General Decision-Making Style Inventory were framed to the provider choice context by referring to the patient's own choice situation in past tense (see Table 2). Afterward, all items underwent a thorough German translation procedure (including backward translations) to ensure semantic equivalence.²²

Subsequently, an expert panel consisting of 3 experienced researchers and 3 patients assessed the content validity of the adapted indicators, resulting in the elimination of 4 items. Two items, IN3 and RA3, were formulated too broadly for the health care context, and the panelists were not able to unambiguously assign them to one style exclusively. Item IN5 inevitably resulted in a long German translation. As a consequence, patients' comprehension of this item was poor. Last, item DE5 was felt to evoke social desirability as patients would rarely admit to be "steered" by others.

Sample and Procedure

During November 2013 and April 2014, the 16-item patient decision-making style scale was distributed to patients who had undergone elective, non-emergency joint surgery within the past 10 years. German-speaking persons who had surgery of the knee, hip, or shoulder joints completed the questionnaire either online or on paper. Overall, the final samples ($n_{\text{online}} = 212$; $n_{\text{offline}} = 176$) covered a wide range of age groups from 16 to 88 years (mean [SD] = 48.35 [19.95]). Besides decision-making styles, respondents reported their individual levels of decision regret,²³ self-perceived health status, and treatment success to control for context-specific biases. First, the larger online sample was used to test the measurement model by means of maximum likelihood confirmatory factor analyses using AMOS 22.0 (IBM Corp., Armonk, NY, USA). Afterward, the offline sample

Table 2 Item Overview

Item Order	Item Code	Items According to Scott and Bruce ¹	Items Used in Survey and Adapted to Provider Choice Context	Final Items in Patient Decision-Making Style Inventory
		English	German	English
<i>Rational decision-making style</i>				
2 (1)	RA1 ^a	I double-check my information sources to be sure I have the right facts before making a decision.	Ich habe noch einmal alle meine Informationsquellen überprüft, um sicher zu sein, dass ich die richtigen Fakten kenne, bevor ich mich für eine Behandlungseinrichtung entschieden habe.	Cronbach's $\alpha_{\text{model C}} = .721$ I double-checked my information sources to be sure I have the right facts before choosing a health care provider.
5 (2)	RA2 ^a	I make decisions in a logical and systematic way.	Ich habe mich auf eine logische und systematische Art und Weise für eine Behandlungseinrichtung entschieden.	When choosing a health care provider, I decided in a logical and systematic way.
— (3)	RA3 ^b	My decision making requires careful thought.	Die Auswahl der Behandlungseinrichtung bedurfte sorgfältiger Überlegungen.	—
11 (4)	RA4	When making a decision, I consider various options in terms of a specific goal.	Als ich die Entscheidung für eine Behandlungseinrichtung getroffen habe, habe ich verschiedene Alternativen hinsichtlich eines konkreten Zieles in Betracht gezogen.	When choosing a health care provider, I considered various options in terms of a specific goal.
13 (25)	RA5 ^c	I explore all of my options before making a decision.	Ich habe alle meine Wahlmöglichkeiten betrachtet, bevor ich mich für eine Behandlungseinrichtung entschieden habe.	I explored all of my options before choosing a health care provider.
<i>Intuitive decision-making style</i>				
1 (5)	IN1	When making a decision, I rely upon my instincts.	Als ich mich für eine Behandlungseinrichtung entschieden habe, habe ich auf mein Bauchgefühl vertraut.	Cronbach's $\alpha_{\text{model C}} = .786$ When choosing a health care provider, I relied upon my instincts.
6 (6)	IN2	When I make decisions, I tend to rely on my intuition.	Bei der Wahl der Behandlungseinrichtung war ich dazu geneigt, mich auf meine Intuition zu verlassen.	As I chose a health care provider, I tend to rely on my intuition.
— (7)	IN3 ^b	I generally make decisions that feel right to me.	Ich habe die Entscheidung für eine Behandlungseinrichtung getroffen, bei der ich ein gutes Gefühl hatte.	—
14 (9)	IN4	When I make a decision, I trust my inner feelings and reactions.	Als ich die Entscheidung für eine Behandlungseinrichtung getroffen habe, habe ich auf meine inneren Gefühle und Reaktionen vertraut.	When choosing a health care provider, I trusted my inner feelings and reactions.

(continued)

Table 2 (continued)

Item Order	Item Code	Items According to Scott and Bruce ¹	Items Used in Survey and Adapted to Provider Choice Context	Final Items in Patient Decision-Making Style Inventory
		English	German	English
— (8)	IN5 ^b	When I make a decision, it is more important for me to feel the decision is right than to have a rational reason for it.	Als ich die Entscheidung für eine Behandlungseinrichtung getroffen habe, war es für mich wichtiger, das Gefühl zu haben, das die Entscheidung richtig ist, als dass es einen rationalen Grund dafür gibt.	—
<i>Dependent decision-making style</i>				
3 (10)	DE1	I often need the assistance of other people when making important decisions.	Ich habe die Unterstützung anderer benötigt, als ich eine Behandlungseinrichtung ausgewählt habe.	Cronbach's $\alpha_{\text{model C}} = .841$ I needed the assistance of other people when choosing a health care provider.
7 (11)	DE2	I rarely make important decisions without consulting other people.	Ich habe die Entscheidung für eine Behandlungseinrichtung nicht getroffen, ohne mich mit anderen Personen zu beraten.	When choosing a health care provider, I consulted other people.
9 (12)	DE3	If I have the support of others, it is easier for me to make important decisions.	Mit der Unterstützung anderer war es einfacher, sich für eine Behandlungseinrichtung zu entscheiden.	Since I had the support of others, it was easier for me to choose a health care provider.
12 (13)	DE4	I use the advice of other people in making my important decisions.	Ich habe den Rat anderer Personen in Anspruch genommen, als ich eine Behandlungseinrichtung ausgewählt habe.	When choosing a health care provider, I used the advice of other people.
— (14)	DE5 ^b	I like to have someone to steer me in the right direction when I am faced with important decisions.	Ich war froh, dass es jemanden gab, der mich in die richtige Richtung lenkte, als ich die Entscheidung für einer Behandlungseinrichtung getroffen habe.	—
<i>Avoidant decision-making style</i>				
4 (15)	AV1	I avoid making important decisions until the pressure is on.	Ich habe es vermieden, eine Behandlungseinrichtung auszuwählen, bis die Entscheidung sehr dringlich war.	Cronbach's $\alpha_{\text{model C}} = .793$ I avoided to choose a health care provider until the pressure was on.

(continued)

Table 2 (continued)

Item Order	Item Code	Items According to Scott and Bruce ¹	Items Used in Survey and Adapted to Provider Choice Context	Final Items in Patient Decision-Making Style Inventory
		English	German	English
8 (16)	AV2	I postpone decision making whenever possible.	Solange es möglich war, habe ich die Entscheidung für eine Behandlungseinrichtung hinausgeschoben.	I postponed the choice of a health care provider as long as possible.
10 (17)	AV3 ^a	I often procrastinate when it comes to making important decisions.	Ich habe gezögert, als es darum ging, sich für eine Behandlungseinrichtung zu entscheiden.	I procrastinated when it came to choosing a health care provider.
13 (18)	AV4	I generally make important decisions at the last minute.	Ich habe mich erst in letzter Minute für eine Behandlungseinrichtung entschieden.	I made the decision for a health care provider at the last minute.
16 (19)	AV5	I put off making many decisions because thinking about them makes me uneasy.	Ich habe die Entscheidung für eine Behandlungseinrichtung aufgeschoben, weil ich mich beim Nachdenken darüber unwohl gefühlt habe.	I put off the decision for a health care provider because thinking about it made me uneasy.

Note: All items were measured on a 7-point Likert scale, ranging from *strongly disagree* to *strongly agree*. Item numbers in parentheses represent the original item order by Scott and Bruce.¹ Cronbach's α has been calculated based on the online sample with $n = 212$. RA, rational; IN, intuitive; DE, dependent; AV, avoidant.

a. Item eliminated during confirmatory factor analysis due to low internal reliability.

c. Item RA5 was not published by Scott and Bruce¹ but has been disclosed by Loo.⁶

b. Item eliminated by expert panel due to missing content validity, fuzziness, or expected social desirability.

Table 3 Fit Measures of Confirmatory Factor Analysis

Models	χ^2 (df)	χ^2/df	GFI	NFI	NNFI	CFI	RMSEA	SRMR
Online sample, n = 212								
Model A (according to a priori theory and panel discussion, 16 items)	215.739 (98)	2.20	.892	.829	.874	.897	.075	.075
Model B (item AV3 excluded, 15 items)	162.130 (84)	1.93	.913	.859	.907	.925	.066	.068
Model C (reduced rational style, 13 items)	94.820 (59)	1.607	.937	.906	.949	.962	.054	.053
Offline sample, n = 176								
Model C (reduced rational style, 13 items)	130.884 (59)	2.218	.904	.863	.891	.918	.83	.067

CFI, comparative fit index; GFI, goodness-of-fit index; NFI, normed fit index; NNFI, nonnormed fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual.

cross-validated the results. Using the statistical power of our study, given its sample size of 388, we also computed correlations among decision-making styles and between each style and participant demographic and treatment factors, including treatment success to test for construct validity.

RESULTS

Internal Structure

Skewness and kurtosis of the online responses were below 2.0 and 7.0, respectively.^{24,25} The initial confirmatory factor analysis showed poor model fit for the 16-item solution, model A (see Table 3).

To improve the model, item AV3 (individual item reliability: $\rho_{AV3} = .280$) was eliminated as its squared multiple correlations were far below the threshold of .40.^{26,27} The next iteration step resulted in an acceptable fit for the 15-item model B according to descriptive fit indices (χ^2/df , nonnormed fit index [NNFI], and standardized root mean square residual [SRMR]) but not to inferential and comparative indices (root mean square error of approximation [RMSEA] and comparative fit index [CFI]).²⁸ On the basis of individual and composite item reliability, we excluded items RA1 ($\rho_{RA1} = .324$) and RA2 ($\rho_{RA2} = .176$) to form the final, 13-item model of patient decision-making style, model C.

In model C, Cronbach's alpha ranged satisfactorily from .72 to .84, implying internal factor consistency. Moreover, fit measures of model C demonstrated sound model fit by all indices (see Table 3) and significantly better fit than model B ($\chi^2_{diff}(25) = 67.31$ with $P < .001$). Model C was cross-validated with the offline sample, and its fit remained satisfactory. Convergence validity was assumed as the average variance extracted by all decision-making style constructs was greater than .50.²⁷ Because the squared correlations between the factors were substantially lower

than the average variance extracted of each style, the Fornell-Lacker criterion indicating discriminant validity was also supported. Last, validity was represented in the overall good fit of model C.²⁹

Distribution of Patient Decision-Making Styles

Mean patient decision-making style values (min = 1, max = 7) showed that online respondents chose their provider in a rather dependent ($M_{dependent} = 4.66$, $SD_{dependent} = 1.61$) and likewise intuitive ($M_{intuitive} = 4.65$, $SD_{intuitive} = 1.51$) manner. Although the manifestation of the rational decision-making style was lower ($M_{rational} = 3.93$, $SD_{rational} = 1.72$), patients still reported to apply this style to a great extent. In contrast, patients hardly approached provider choice in an avoidant manner ($M_{avoidant} = 2.23$, $SD_{avoidant} = 1.24$). This distribution pattern is different from general choice contexts where commonly, the rational decision-making style is most prevalent^{6,12,13,30} and thus underscores the contextuality of decision-making styles.

As the application of decision-making strategies may be influenced by external factors,³¹ we controlled for *individual characteristics* of the decision maker and *treatment process variables* that could potentially lead to context-specific bias. As a result, we found no significant differences in patient decision-making styles regarding gender, health status, or prevalence of chronic diseases. However, the younger half of our online sample (≤ 30 years) displayed significantly stronger dependent decision-making style habits than did older patients, $F(2.5, 50.5) = 10.384$, $P < .001$. This effect may be explained by older people's experience of life and longstanding independence. Regarding treatment process variables, only the intuitive patient decision-making style showed a small but significant negative correlation with decision regret ($r = -.177$, $P < .01$). However,

no patient decision-making style was correlated with treatment success. These results suggest that the responses were not biased by individual characteristics or by outcomes of the treatment process as context-specific determinants.

Although earlier studies reported several correlations among decision-making styles,^{1,6,11} only 2 significant correlations were observable in our data. First, the rational patient decision-making style correlated positively with the dependent patient decision-making style ($r = .339$, $P < .01$). Second, rational patient decision-making style was positively correlated with avoidant patient decision-making style ($r = .229$, $P < .01$). Interestingly, we did not observe other previously reported correlations among styles (e.g., between avoidant and dependent styles^{11,12}). The observed correlation patterns could imply that patients potentially use dependence or avoidance mechanisms in provider choice as “effort-reducing” decision strategies.³¹

DISCUSSION

The final patient decision-making style inventory covers 13 items and 4 dimensions. It is the first approach to comprehensively link psychological styles in decision making to choice contexts in health care. While 3 dimensions of the general scale stand firm in this particular context-specific adaption, the rational decision-making style as defined by Scott and Bruce¹ was not fully realized in the patient choice context. The rational dimension appears to be divided into 2 conceptual components: first, the systematic gathering and deliberate weighing of information (items RA1 and RA2) and, second, the active consideration and balancing of alternative options (items RA4 and RA5). However, tests of this 2-component model did not show robust results across the 2 independent samples, which led to the exclusion of RA1 and RA2 from the model. This study argues that patient’s “rational” decision-making style is revealed in the exploration of different alternatives rather than in the vigilant gathering of information. On the basis of this reasoning, we propose to redefine the “rational” subdimension (items RA4 and RA5) for the context of provider choice as a “comparative” patient decision-making style, which we define as the situation-specific propensity of weighing alternative options (providers) as information bundles against each other. In this context, we assume that forming a global judgment about one option or another makes it easier for patients to trade off complex information.³²

Researchers should not assume the complete applicability of Scott and Bruce’s General Decision-Making Style Inventory¹ within specific choice contexts. Depending on choice characteristics, for example, task complexity, or uncertainty,³¹ styles prove to be malleable. Therefore, future research on decision-making styles should consider the contextuality of this concept and seek deeper understanding of the reasons for the observed patterns of decision-making styles.

Based on this report’s findings, it cannot be judged which patient decision-making style leads to which patient outcome. This research rather provides a framework for scholars to investigate the consequences and outcomes of specific patient decision-making styles. In previous research on general decision-making styles, rational and intuitive decision-making styles were judged as rather effective strategies, whereas avoidant and dependent decision-making styles were said to be rather maladaptive.^{5,6,10} Future research should test if this holds true in health care contexts.

With further insight into the mechanisms of specific decision-making styles, the presented inventory may become useful for practice. For patients, the inventory is a novel tool to understand their personal health identity and may inform decision aids. For example, more dependent decision makers could be encouraged to seek second opinions.³³ For providers, understanding patient decision-making styles may enable them to react more efficiently to their patients’ needs. For example, targeted communication strategies, such as providing avoidant decision makers with information on how to cope with fear or suppression, might induce a change of attitude toward health-related decisions.

ACKNOWLEDGMENT

The authors gratefully acknowledge the funding provided by the European Social Fund and the Free State of Saxony, Germany, to support this research. However, these funding sources had no involvement in the conduct of the research or the preparation of the manuscript. Moreover, we thank the editor-in-chief and 2 anonymous reviewers for their valuable comments on earlier drafts of this manuscript.

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