

The Effect of Intuitive Advice Justification on Advice Taking[†]

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ABSTRACT

How do you respond when receiving advice from somebody with the argumentation “my gut tells me so” or “this is what my intuition says”? Most likely, you would find this justification insufficient and disregard the advice. Are there also situations where people do appreciate such intuitive advice and change their opinion accordingly? A growing number of authors write about the power of intuition in solving problems, showing that intuitively made decisions can be of higher quality than decisions based on analytical reasoning. We want to know if decision makers, when receiving advice based on an intuitive cognitive process, also recognize the value of such advice. Is advice justified by intuition necessarily followed to a lesser extent than an advice justified by analysis? Furthermore, what are the important factors influencing the effect of intuitive justification on advice taking? Participants across three studies show that utilization of intuitive advice varies depending on advisor seniority and type of task for which the advice is given. Summarizing, the results suggest that decision makers a priori doubt the value of intuitive advice and only assess it as accurate if other cues in the advice setting corroborate this. Intuitively justified advice is utilized more if it comes from a senior advisor. In decision tasks with experiential products, intuitively justified advice can even have more impact than analytically justified advice. Copyright © 2013 John Wiley & Sons, Ltd.

KEY WORDS advice taking; justification; decision making; intuition; analysis

INTRODUCTION

According to many students of human decision making, decisions can be based on intuition or analysis (Bruner, 1986; Epstein, 1994; Hammond, 1996; Kahneman, 2003; Sloman, 1996, but see Kruglanski & Gigerenzer, 2011). They argue that people can make decisions on the basis of two different cognitive systems. In the first system, *the intuitive system*, decisions are fast, automatic, unconscious, associative, and tacit, and this system is not accessible for introspection. In the other system, *the analytical system*, decision making is slow, controlled, conscious, rule-based, and deliberate. Some authors, for example Stanovich and West (2000) and Kahneman (2003), have called the two systems simply System 1 and System 2, respectively.

Traditionally, among academics, there is a clear preference for an analytical approach to problem solving (Kotler, 1971; Russo & Schoemaker, 2002). Intuition is seen as having a lower intellectual standing and can be a synonym for “sloppy thinking” (Hogarth, 2001, p. 4). Indeed, the advantages of using analytical models in practice have been extensively documented (Lilien & Rangaswamy, 2008; Wierenga, Van Bruggen, & Althuizen, 2008). However, a growing number of authors write on the power of intuition in solving problems (Dijksterhuis, 2004; Dijksterhuis, Bos, Nordgren, & Van Baaren, 2006; Hogarth, 2001; Wilson & Schooler, 1991), and they find that under certain conditions, intuition outperforms analysis. In marketing, Blattberg and Hoch (1990) found that a combination of managerial intuition and

analytical thinking performed better than an analytical model alone. These findings are in agreement with the new picture of the unconscious that has emerged in psychology. According to this picture, unconscious processes are capable of many things that were thought to require intention, deliberation, and conscious awareness (Hassin, Uleman, & Bargh, 2005). Hogarth (2001) published an extensive study on where intuition comes from, how it works, and whether we can trust it. His conclusion is that intuition is a normal and important component of thought, and that we should pay attention to “educating intuition” (the title of his book) in order to benefit more from this “sixth sense.”

If intuition is increasingly recognized by academics as a powerful basis for good decisions, to what extent is intuition also accepted by decision makers as a valuable input for their decisions? The goal of this paper was to find out if, and under which conditions, decision makers are inclined to follow others’ insights that are explicitly based on intuition. In this paper, we look at advice giving. For many decisions, people ask advice from others before making a decision, and usually this advice has an impact on the decision. Advice can be based on intuition or analysis. The extent to which people are willing to follow intuition-based advice tells us something about the value they attach to intuition. Our context is managerial decision making, more specifically marketing decision making. Few managers make important decisions in isolation. In fact, managerial decision making is becoming more and more consultative. Vroom and Jago (1988) identified five methods of managerial decision making. Interestingly, in three of these, decision makers receive advice and information from others but make the final decision alone. Indeed, advice seeking behavior has been proposed to be an important determinant in strategic managerial decisions (Arendt, Priem, & Ndofofor, 2005; McDonald & Westphal, 2003).

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Until the 1990s, little consideration was given to the use of advice in empirical studies about decision making. However, as research on advice grows, scholars are beginning to understand what causes specific advice messages to be utilized differently. So far, it has been found that utilization of advice is dependent on *what* is advised (Dalal & Bonaccio, 2010; Yaniv & Foster, 1997; Yaniv & Kleinberger, 2000), *by whom* it is advised (Feng & MacGeorge, 2006; Jungermann & Fischer, 2005; Van Swol & Sniezek, 2005; Yaniv & Kleinberger, 2000), *to whom* it is advised (Harvey & Fischer, 1997; Sniezek, Schrah, & Dalal, 2004; Yaniv, 2004; Yaniv & Kleinberger, 2000), *about what* it is advised (Gino & Moore, 2007; Schrah, Dalal, & Sniezek, 2006), and the *content of the advice*, for example, providing information about the alternatives (Dalal & Bonaccio, 2010). However, so far, no explicit attention has been paid to the *justification of advice*, in particular, if the advice is justified by intuition or by analysis, and the effect of the justification on subsequent advice utilization. The absence of research in this area is surprising because in real life, advice is seldom offered without some form of justification.

Thus, the question in this paper is the following. What is the effect of advice justification (intuition versus analysis) on the utilization of advice, in the context of managerial decision making? We expected that, a priori, decision makers are suspicious about intuition. Going back to Plato, people are supposed to rely on analysis. Today's decision-making courses typically recommend analytical approaches. Pieces of advice that are the result of an analytic process appear more credible than suggestions based on vague hunches. However, there may be situations where decision makers do follow intuitive advice. If this is the case, what characterizes such situations? No research to date has examined the extent to which decision makers are actually willing to rely on someone else's intuition when making decisions.

THEORETICAL BACKGROUND

Advice taking in management

Most important organizational decisions are not made by one manager in a social vacuum. Arendt et al. (2005) proposed a "CEO-Adviser model" of strategic decision making in which a manager acts as final decision maker, but receives advice from (internal and/or external) advisors as input in the decision making process. This model is in line with Vroom and Jago's (1988) "consultative" managerial decision making styles and the judge-advisor model developed in the organizational behavior literature (Sniezek & Buckley, 1995; Sniezek & Van Swol, 2001). Being a blend of individual managerial decision making and group (top management team) decision making, such a model is argued to be a realistic model of managerial decision making for a wide range of firms. As such, advice seeking in organizations can be captured by an organizational model in which an organizational member (a colleague) gives advice to another organizational member (the decision maker). Literature suggests that such advice-seeking interactions with colleagues

have significant influence on managers' strategic decisions (Alexiev, Jansen, Van den Bosch, & Volberda, 2010; McDonald & Westphal, 2003). This underscores the importance of research into the use of advice in (managerial) decision-making processes.

Advice taking and justification

One of the most robust findings in the advice literature is the "egocentric discounting effect" (Yaniv & Kleinberger, 2000). Several studies found that decision makers do not follow their advisors' recommendations nearly as much as they should to truly benefit from them. Instead, they overweigh their own opinions relative to that of their advisors and tend to shift a "token" amount—about 25% on aggregate—toward their advisor's opinion (Harvey & Fischer, 1997). Yaniv (2004) argued that this occurs because decision makers have access to their own underlying justifications and the strength of the arguments that support their decisions. In contrast, they do not have access to their advisors' webs of thoughts and, as a consequence, have less access to evidence justifying the advisors' decisions. This could imply that adding any justification for advice, either intuitive or analytical, would be beneficial to advice taking, because a decision maker will have more insight into the underlying justification for the given advice. This is also consistent with those of Langer, Blank, and Chanowitz (1978) who found that adding a reason to a request will increase compliance, even if the reason conveys no information. Alternatively, we might argue that adding a justification for advice allows for this very justification to be processed for accuracy by the decision maker, just like other cues in the advice-taking context are processed to assess the quality of the advice (Yaniv & Kleinberger, 2000). Dependent on the decision maker's beliefs about the quality of the advisor's intuition, we might expect a differential effect based on type of advice justification. In order to determine in what direction we could expect such an effect, we first need to look at the literature about the use of intuition in decision making.

Intuition in decision making

Although "System 1," as discussed earlier, is mostly referred to as "the intuitive system," the scientific literature does not provide a concise definition of the term intuition (Hogarth, 2001). The common understanding of intuition involves elements such as speed of knowing, the lack of a deliberative or rational thought process, and the notion of a store of knowledge and insight that has been built up over time (Hogarth, 2001, p 7). A substantial body of traditional research suggests that the use of intuition in decision making has a lower status than the use of analysis (Dawes, Faust, & Meehl, 1989; Kahneman, 2003). Scholars of decision making have demonstrated that intuitive thinking is subject to all sorts of biases and flaws (Tversky & Kahneman, 1974). Bonabeau's (2003) article in *Harvard Business Review* even carries "Don't trust your gut" as a telling title, claiming that intuition is unreliable and analytical tools should be applied instead. Using numerous examples, Clancy and Krieg (2007)

demonstrated how good analysis leads to legendary marketing strategies and how intuition repeatedly falls short. In a similar vein, Russo and Schoemaker (1989) argued that intuition can be dangerous for serious decisions and can result in corporate blunders. Dawes et al. (1989) summarized research that consistently shows that an actuarial (analytic) method of decision making is superior to a clinical (intuitive) method. Indeed, there are many success stories about the use of analytical decision aids in managerial decision making (Lilien & Rangaswamy, 2004; Wierenga & Van Bruggen, 2000).

Even though in recent literature there has also been growing recognition of the value of intuition and the power of tacit knowledge, the idea that an analytical approach to decision making is more scientific and has a higher intellectual standing still seems to be more prevalent. What does this mean for decision makers who receive advice that is justified as “intuitive,” compared with receiving the same advice, justified as “analytic”? Most likely, the answer to that question depends on certain characteristics of the situation.

The first cue presumably affecting the perceived value of intuitively justified advice is the advisor. What are the characteristics of advisors with a “good intuition”? Intuition is one of the defining features of expertise (Gobet & Chassy, 2009). Although there are differences in the explanation of intuition (Dreyfus & Dreyfus, 1988; Simon, 1989), most authors agree that it takes a long time and much exercise to become an expert in a specific field. It takes a large amount of practice for a novice to reach expert level and thus show effective intuitive behavior (Gobet & Chassy, 2009). People with more practice in a specific field can be expected to have better developed intuitions, assuming a “kind learning structure” that is a learning structure favorable to learning (Hogarth, 2001). Intuition is also very close to the concept of “tacit knowledge,” non-articulated knowledge that arises without explicit attempts and helps in dealing with practical problems (Cianciolo, Matthew, Sternberg, & Wagner, 2006). Wagner (1987) developed a tacit knowledge inventory to measure a person’s tacit knowledge. For this measurement, a person is asked what she or he would do in (hypothetical) practical situations, and these responses are compared with what recognized experts would do. In an application in business management, Wagner found that business professionals with more years of experience have more tacit knowledge. This is an empirical confirmation that people with more practice in a specific field have better tacit knowledge and, hence, better intuitions.

Second, there is the nature of the decision problem. Problems come in many variations. For example, problems can differ in structuredness, complexity, and domain specificity. Different problem types pose different requirements for their solution (Jonassen, 2000). Payne (1982) observed that decision making is highly contingent on the demands of the task. Hammond, Hamm, Grassia, and Pearson (1987) made a distinction between the intuitive approach and the analytical approach to problem solving and provide specifications of task characteristics that are “intuition inducing” and “analysis inducing,” respectively. For example, intuition-inducing tasks have the following characteristic:

a large number of cues, high uncertainty, lack of organizing principles, and low decomposability. Analysis-inducing tasks are just the opposite. In an empirical study (where highway engineers had to make predictions about highway esthetics, highway safety, and highway capacity), these authors showed that the greater the correspondence between task properties and the cognitive model that the respondents used (intuitive versus analytical), the better their performance. It turned out that analytical processing is not always better. This is clear for the prediction of highway esthetics, which evidently requires an intuitive approach. However, also when predicting highway capacity, more than half of the highway engineers performed better in the intuitive condition than in the analytical condition. The notion that there should be a match between the cognitive system used by the decision maker and the task at hand is also demonstrated in a study by McMakin and Slovic (2000). They found that on an intuitive task (judging the effectiveness of advertisements), explicit reasoning degraded judgment quality; whereas on an “analytical” task (making quantitative judgments about such subjects as the surface of the USA and the annual consumption of cigarettes), explicit reasoning enhanced performance. These results demonstrate again the quality of intuitive decisions. If under certain conditions, intuition is a good basis for decision, it is imperative that under such conditions decision makers follow intuitively justified advice.

Thus, we see that the nature of the advisor and the nature of the decision problem are likely to condition the effect of intuitive advice justification (vs. analytical justification) on the utilization of the advice. Therefore, we include these two variables in our study. We start with the basic effect of intuitive versus analytic advice justification on advice taking.

STUDY 1: BASE CASE EFFECT

What is the effect of adding a particular justification (either intuitive or analytical) to a piece of advice? In the first study, which acts as a base situation, we take a “middle-of-the-road” decision problem and an advisor at the same, junior, level of seniority as the advisee. More specifically, the task is a go/no-go decision for the introduction of a brand in the category of consumer packaged goods in a new market (a new country). In the terminology of Hammond et al. (1987), this problem has both intuition-inducing characteristics (e.g., the decision maker needs to have a feeling for the market in the new country) and analysis-inducing characteristics (e.g., the decision maker can make calculations about the expected sales and profits, on the basis of population numbers and current sales of competitors). The advisor gives advice (yes or no) about introducing the brand in the new market. What would be the effect of adding a justification to this advice, be it an intuitive or an analytical justification? As mentioned before, in general, intuition has negative associations: sloppy thinking, unreliable, “do not trust your guts,” and so on. In a more popular context, intuition is sometimes connected to concepts such as New Age, and it has spiritual and transcendent connotations (Guenther, 1958; Vaughan, 1979). Such mystical and magic connotations of intuition do not

strengthen the belief that it can help with making a good decision about the introduction of a new product. Furthermore, as we discussed, intuition is more associated with experienced persons than with novices. In the situation of Study 1, the advisor is a “colleague” of the same level as the decision maker (who is quite junior), which should not add to the credibility of the intuition. Therefore, we predict that an intuitive justification will decrease the impact of the advice about the introduction of the new product.

Hypothesis 1: The impact of the advice will be negatively affected by an intuitive justification and positively by an analytical justification.

Design

Study 1 was concerned with how advice justification affects advice taking. We studied advice utilization in an organizational model, where one organizational member gives advice to another organizational member (the decision maker). We used a three-cell (advice justification by intuition; advice justification by analysis; no advice justification) between-participants design.

Pretest

In order to ensure that the advice justifications we used in this study were actually perceived by the decision makers as being based on intuitive or analytical thinking, we carried out a pretest. In the pretest, we gave respondents 12 different types of justifications, six intuitive ones and six analytic ones, and asked them to evaluate the extent to which they felt that each justification was the outcome of an intuitive process or the outcome of an analytical process.¹ The response scale ranged from 0 (*very intuitive*) to 10 (*very analytic*), and the statements were given to each respondent in random order. There were 98 respondents in the pretest.

As can be concluded from Table 1, the justifications labeled by the researchers as intuitive were also assessed by the respondents as very intuitive (average values around 2) as opposed to the analytic justifications that were assessed as very analytical (average values around 7). The only exception is “I have an insight that suggests,” for which we found a mean response of 3.94. We excluded this justification from the consideration set, because this value lies closer to the neutral point (5) than to the intuitive end of the scale. The three statements per justification type that we used in the actual experiment are given in bold.

Procedure

We used a strategic go/no-go problem as focal strategic task in this study. Go or no-go decisions are frequently encountered in management, involving whether to launch a

new product in market X or whether to introduce a new campaign in country Y, for example.

We let participants take on the role of a junior product manager in a consumer packaged goods company. Their task was to indicate the extent to which they would recommend top management to go ahead with a launch of the product they were responsible for, an American potato chips product, on a foreign market. The scenario stated that the potato chips had already successfully been introduced on the Dutch market and that management was now thinking about launching the chips in Italy.

Respondents received a condensed summary of the decision problem on which to base their answer. Before obtaining this information, participants were told that their decision was very important, that a launch would cost millions of euros, and that other investment opportunities would be foregone if they decided to invest in the Italian market. After receiving the market information, participants were asked to indicate the extent to which they would recommend launching the product in Italy on a slide bar anchored “definitely a no-go” on the left and “definitely a go” on the right that corresponded to 0% and 100%, respectively, on an underlying choice continuum. By default, the slide bar knob was located in the middle (50%, i.e., indifference between the options).

Because of “the importance of the case,” participants were then asked to listen to what a colleague had to say about this issue. This colleague subsequently gave three pieces of advice—all favoring a *launch* of the product—that were either justified by intuition, by analysis, or that were not justified. Note that the informative content of the three pieces of advice was the same in all justification conditions. The advice content was as follows:

1. The market is not too different: Italians are keen on American products.
2. Italians will prefer [Brand name] over other salty snacks: it should be a go.
3. [Brand name] has the potential to drive primary demand and change consumption patterns in Italy.

Advice that was justified by intuition started with “My gut tells me,” “If I go with what my intuition says,” or “Intuitively I would say,” and was then followed by the content of the advice (1, 2, or 3). In contrast, advice that was justified by analysis started with “The market research data tell me,” “If I go with what the consumer data says,” or “Judging from the competitor analysis I would say,” and was then followed by the advice content (1, 2, or 3). Every respondent received the same three pieces of advice content (listed earlier). However, in the intuition condition, each of these advice pieces was accompanied with one of the three intuitive justifications (top left in Table 1), randomly drawn. The analytical condition was similar, but here the justifications were analytical (top right in Table 1). Each advice justification form and advice content was used once in a random combination so that a total of three pieces of advice were given to a respondent (three intuitively justified pieces of advice in the intuitive justification condition; three analytically justified pieces of advice in the analytic

¹The respondents had to use their own “lay” interpretations of intuition and analysis. No definitions of these terms were provided.

Table 1. Mean intuition/analysis ratings and standard deviations per justification type

Intuitive justifications	<i>M</i>	<i>SD</i>	Analytic justifications	<i>M</i>	<i>SD</i>
My gut tells me	1.86	1.21	The market research data tell me	7.92	1.58
If I go with what my intuition says	2.02	1.51	If I go with what the consumer data say	6.88	1.95
Intuitively I would say	1.92	1.48	Judging from the competitor analysis I would say	7.08	1.34
I have an insight that suggests	3.94	2.14	I have data that suggest	7.58	1.66
My inner voice whispers	1.76	1.41	The market study signals	7.66	1.72
My gut feeling says	1.92	1.21	The analysis says	8.44	1.61

Measurements were taken on 10-point Likert scale (1 = *very intuitive*/10 = *very analytical*). Statements in bold were used in Experiments 1–3. *N* = 98.

justification condition). In the no justification condition, justification for the advice was left out, and the advice content read exactly as stated earlier. The order of presentation of the pieces of advice was random. We think that the decision situation and the task that the respondents had to carry out were very realistic. Such occasions happen in the real world all the time, and this probably was also the motivation for the Harvard Business School case on which the scenario of this paper is loosely based (Shapiro, 2000).

After receiving their colleague's advice, participants were asked again to indicate on a slide bar anchored, definitely a no-go on the left and definitely a go on the right, which corresponded to 0% and 100% on the choice continuum, respectively, to what extent they recommended to launch the potato chip product. Again, the slide bar knob was initially positioned in the middle.

Dependent variable

Advice utilization in judgment tasks is commonly measured by a formula that weighs the extent to which the decision maker's final answer is a function of her own initial answer versus the advisor's recommendation (Bonaccio & Dalal, 2006; Gino, 2008; Harvey & Fischer, 1997; Yaniv, 2004). We use a standard measure (Harvey & Fischer, 1997) that uses the ratio of the difference between the decision maker's final and initial estimate, and the difference between the advisor's estimate and the decision maker's initial estimate. So we measure our dependent variable, advice taking, as follows:

$$\text{Advice-Taking} = \frac{(\text{Final Estimate} - \text{Initial Estimate})}{(\text{Advised Estimate} - \text{Initial Estimate})}$$

Because the advice was strongly in favor of a launch, we equated the "advised decision" with a virtual position of 100 on the underlying choice continuum. The advice-taking measure thus reflects the degree to which a participant updates in the direction of the advice she or he received.

Results

Seventy-six undergraduate students (55 men and 21 women) participated in this study in return for extra course credit. Data from five respondents (four in the intuitive advice condition; one in the analytic advice condition) yielded an undefined value because these respondents' initial decisions

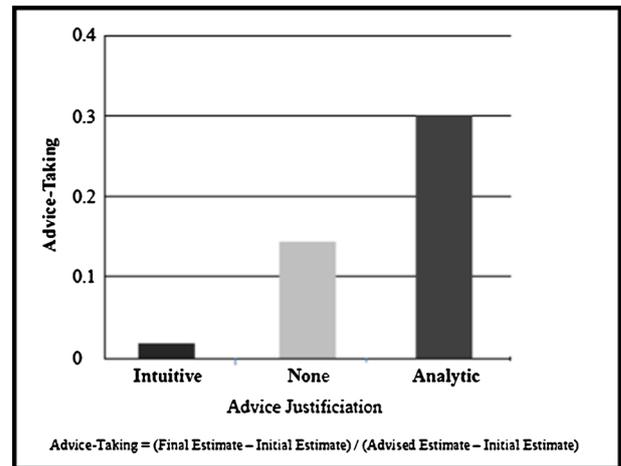


Figure 1. Study 1—mean advice taking values per condition

were exactly the same as the advised decision (100). In these cases, it is not possible to quantify how much a participant did or did not use the advice. In line with previous research (Gino, 2008; Gino & Moore, 2007; Yaniv, 2004), we left out these cases from our analysis.

Results are displayed in Figure 1. Our results show that advice justification significantly influenced advice taking, $F(2, 68) = 5.91$, $p < .01$. Mean advice taking in the intuitive justification condition was significantly lower than it was in both the no justification condition, $t(50) = 1.85$, $p = .04$, and the analytic justification condition, $t(40) = 3.45$, $p < .01$ (one-sided test). Mean advice taking in the analytic justification condition was significantly higher than in the no justification condition, $t(46) = 1.84$, $p = .04$. These results confirm our Hypothesis 1. Thus, an intuitive justification undermines the effect of the advice about the new product introduction. An analytical justification, on the other hand, increases the impact of the advice. Apparently, in this situation, the decision maker does not trust the gut intuition of the advisor, a colleague junior product manager.

Discussion

In this first study, we found that adding a justification for advice has an influence on advice utilization and that the justification type matters significantly. Adding an analytic justification to advice was beneficial to advice taking, compared with a situation in which a justification was absent. Whereas prior research has found that adding any justification for a request increases compliance (Langer et al., 1978), we

find that adding an intuitive justification decreases compliance compared with a condition in which the advice is given without any justification. We reason that this occurs because decision makers cannot assess the accuracy of their advisor's intuition and might consider it equivalent to sloppy thinking. Without any other cue that would hint at the quality of the advisor's intuition, decision makers may not utilize it.

The results from Study 1 are in agreement with the traditional beliefs discussed earlier: Analysis helps and intuition does not. In this study, it even reduced advice taking and analytical justification as far more effective than intuitive justification. Is this always the case, or are there circumstances where intuitively justified advice is doing much better? There are reasons to expect that such conditions exist, especially in the light of recent insights among academics about the value of intuition that we discussed earlier. Interestingly, not only academics but also managers seem to feel increasingly confident that they can trust their gut. A survey conducted by Jagdish Parikh (discussed in Buchanan & O'Connell, 2006, p. 40) shows that executives used their intuition as often as formal analysis and even accredited 80% of their successes to instincts. Hayashi (2001) framed several high-profile top-management decisions, including the creation of Federal Express and the prime-time launch of blockbuster *Who Wants to be a Millionaire*, as intuitive or "gut" decisions.

Therefore, it is worthwhile to look for conditions where a good deal of intuition on the side of the advisor is acceptable or even appreciated. We examined this in the next two studies. In Study 2, we examine what happens if the advice comes from a senior person, in this case a senior product manager.

STUDY 2: EFFECT OF THE SENIORITY OF THE ADVISOR

Effects of the characteristics of the advisor have been reported in the literature outside the context of intuitive versus analytical justification. Önkal, Goodwin, Thomson, Gönül, and Pollock (2009) found that decision makers pay more attention to advice coming from a human expert (in which intuition inherently plays a role) than to advice generated by a statistical forecasting method (in which intuition is absent). Echoing this finding, patients have been found to prefer receiving advice from a physician than from a computer program (Promberger & Baron, 2006). Earlier, we mentioned that intuition is linked to expertise and that expertise becomes stronger as people have more practice in a particular field, assuming a "kind" learning structure (Hogarth, 2001). Specifically, prior research has found that if an advisor has task-relevant expertise, or "expert power," decision makers will utilize the advice more (Birnbaum & Stegner, 1979; Jungermann & Fischer, 2005). This also holds if the decision maker is less knowledgeable or experienced than the advisor (Harvey & Fischer, 1997; Sniezek et al., 2004). Thus, junior decision makers are likely to take more advice from senior advisors than from equally junior peers.

In this paper, we are especially interested in the combination of seniority with intuitively justified advice.

We expected that the seniority advantage is especially pronounced for intuitively justified advice. Intuition has been conceptualized as "learning shaped by experience" (Hogarth, 2001, p. 19). Therefore, the more experienced persons can be expected to have better intuitions. Consequently, the same intuitive advice that is completely ignored if it comes from another junior manager may in fact be greatly utilized if it comes from a senior manager. However, there is also a counter argument, namely that the reasoning behind intuitive advice remains inaccessible for the decision maker, also when the advisor is senior. Slovic, Fleissner, and Bauman (1972) tried to recover decision rules for experienced stock brokers and MBA students. They found that the correlation between objective and subjective cue weights is .34 for experienced stock brokers and .79 for students. Furthermore, among brokers, this correlation decreased with years of experience. This suggests that among experienced decision makers, self-insight about their decision making can be quite low. Would the decision maker really follow such advice generated by an inaccessible process? There is one additional reason why an intuitively justified advice from a senior manager, nevertheless, will get more weight. People also use advice because of their accountability to others (Kennedy, Kleimutz, & Peecher, 1997). Even if you do not understand the underlying reasoning of the advisor, following the advice of the senior person is easier to defend to your superior. Analytical advice, on the other hand, is based on logical reasoning. This can be learned at school, for example, and is less influenced by years of accumulated experiences in a particular job. Therefore, its acceptance will be less affected by the seniority of the source of the advice.

The aforementioned considerations led to our Hypothesis 2.

Hypothesis 2: The effect of intuitive versus analytical justification on advice taking is moderated by the seniority of the advisor, such that the negative effect of intuitive (vs. analytical) justification is reduced when the advisor has a higher level of seniority than the decision maker relative to when both are equally junior.

Design

The second study was designed to test Hypothesis 2. The experiment explored how advisor seniority affects intuitive and analytic advice taking. We used a 2 (advice justification: by intuition vs. by analysis) \times 2 (advisor seniority: junior vs. senior) between-participants design.

Procedure

We used the same procedure as in the first experiment and let respondents indicate the extent to which they would recommend top management to go ahead with the launch of a potato chips product on the Italian market, both before and after receiving advice from a colleague. In this study, dependent on the condition participants were assigned to, the colleague who presented the advice was either a junior

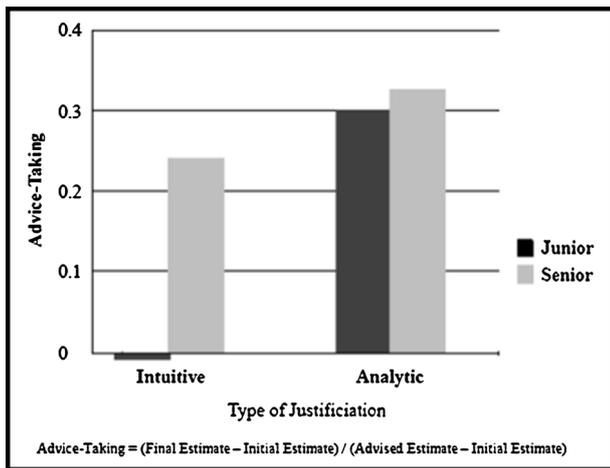


Figure 2. Study 2—mean advice taking values per condition

product manager, and thus had the same level of seniority as the decision maker, or a senior product manager.

Results

One hundred and eighteen undergraduate students (82 men and 36 women) participated in this study in return for extra course credit. Data from three participants (two in the senior advisor/intuitive advice condition; one in the senior advisor/analytic advice condition) were excluded because they yielded an undefined value.

Figure 2 displays the results. Consistent with the results in Study 1, we found a significant main effect of advice justification on advice taking, $F(1, 111) = 8.97$, $p < .01$. Participants utilized more advice if the advice was justified by analysis ($M = .32$, $SD = .26$) than if the advice was justified by intuition ($M = .08$, $SD = .37$). We also found a main effect of advisor seniority on advice taking, $F(1, 111) = 5.44$, $p = .02$. Participants utilized more advice from a senior advisor ($M = .29$, $SD = .25$) than from a junior advisor ($M = .11$, $SD = .37$).

Both main effects were qualified by a significant interaction effect of advice justification and advisor seniority on advice taking, $F(1, 111) = 4.06$, $p = .05$. When the advisor was an equally junior colleague, mean advice taking was $-.097^2$ in the case of intuitive justification and $.303$ in the case of an analytical justification, a significant difference, $p < .01$. When the advisor is more senior, mean advice taking is $.250$ in the case of intuitive justification and $.328$ in the case of analytical justification. This difference is not statistically significant, $p = .51$. Thus, with a junior advisor, an analytical justification makes the advice more impactful than an intuitive justification; with a senior advisor, there is no significant difference. Analyzed differently, for intuitive advice, mean advice taking was $-.097$ in the case of a junior advisor and $.250$ in the case of a senior advisor. This difference is

²The minus sign indicates that one average the final decision is even slightly in a direction opposite from the advice.

significant, $p < .01$. For an analytical advice, mean advice taking is $.303$ in the case of a junior advisor and $.328$ in the case of a senior advisor. This difference is not significant, $p = .82$. These results confirm Hypothesis 2.

In the second study, we found that junior decision makers completely discounted intuitive advice from another junior manager. (On average, they even, very slightly, moved away from that advice.) However, when the same intuitive advice came from a more senior advisor, it significantly influenced the junior decision maker's opinion. Hence, decision makers seem to discount intuitive advice to a different extent dependent on advisor seniority. Alternatively, advice that is justified by analysis seems to be robust for advisor seniority. Because an analytic justification is based on mindful analysis, the decision maker who is evaluating the advice obtains insights into the web of thoughts (rules and logic) that could have guided the advisor in coming up with the advice. Consequently, other possible cues that hint at high-quality advice, such as advisor seniority, may not be essential here. In Study 1, we found that an intuitive justification of advice has a negative effect on its impact. In Study 2, we found that this is the case for a junior advisor, but that for a senior advisor the effect of an intuitive justification is not significantly different from an analytical justification anymore. A natural question, then, is if there are also situations where an intuitive justification of advice has an even larger impact than an analytical justification? For this purpose, we turn to another element of the advice situation, the decision task in Study 3.

STUDY 3: WHEN INTUITIVE ADVICE IS STRONGER

In Study 2, we found the expected effect of advisor seniority on the utilization of intuitively justified advice. However, as can be seen from Figure 2, in the senior advisor condition, the influence of analytic advice was still larger than that of intuitive advice (albeit this difference is not statistically significant). As mentioned earlier, prior research has found that intuition can outperform analysis on certain tasks (Dane & Pratt, 2007; Hammond et al., 1987; McMakin & Slovic, 2000). In the context of the present paper, our question is whether this is also the case for advice taking. Are there tasks for which intuitive advice is more influential than analytic advice? Dane and Pratt (2007) mentioned task characteristics as important factors that influence the effectiveness of intuition. In the discussion about when intuition and analysis are the most effective ways to solve a problem, authors in the literature use a different terminology for the characteristics of the task. For example, Shapiro and Spence (1997) and Jonassen (2000) used the term "structuredness" of a problem. Claxton (1998) and Hayashi (2001) spoke about well-defined versus ill-defined problems. Hammond et al. (1987) spoke of intuition-inducing versus analysis-inducing problems. Our goal was to create an intuition-inducing task that would allow us to demonstrate the existence of

situations in which intuitively justified advice is superior to analytically justified advice, if such a reversal exists. As discussed earlier, the product go/no-go task for the introduction of a new product, used so far, has both analysis- and intuition-inducing elements. However, what will happen if we would take a more pronounced intuition-inducing task? Would the decision makers in this case follow intuitively justified advice more than analytically justified advice? Any such positive effect of intuition (vs. analysis) is much more likely to occur for senior than junior advisors, as junior advisors have less of the expertise and experience required to form accurate intuition. We will demonstrate that there are intuition-inducing tasks, where in combination with a senior advisor, advice taking for intuitively justified advice is greater than for analytically justified advice. For an intuition-inducing task, we use an experiential product: the choice of a movie.

Hypothesis 3: For intuition-inducing tasks such as the choice of a movie, in combination with a senior advisor, advice taking for intuitively justified advice can be greater than for analytically justified advice.

Design

The third experiment was designed to test Hypothesis 3. This experiment was concerned with how advisor seniority affects intuitive and analytic advice taking, on an intuition-inducing task. As in the second experiment, we employed a 2 (advice justification: by intuition vs. by analysis) \times 2 (advisor seniority: junior vs. senior) between-participants design.

Procedure

As an intuition-inducing task, we chose a movie selection problem.

We let participants take on the role of a junior account manager at a global entertainment company. They would supposedly work for the motion pictures division of the company, and their task was to indicate the extent to which they would recommend top management to select one of two movies for marketing and distribution. The real movies respondents had to indicate their preference for were *Case 39* and *Shutter Island*. This study was carried out before both movies premiered in the USA, and as such we expected European students to be unfamiliar with them as movies usually premiere several months later in Europe. This task is clearly more intuition inducing than the decision about introducing a new product in the category of consumer packaged goods in a new market, as we had before. First, movies are experiential products with a high potential of stirring feelings and emotions. Movies have this in common with other media and entertaining products. Information about such products is best processed in an intuitive way (Dane & Pratt, 2007; Hayashi, 2001). Second, esthetics is important for movies, and Hammond et al. (1987) found that for judging esthetics, an intuitive approach is most effective. Third, it has been found that environmental uncertainty increases the

effectiveness of intuitive decision making (Khatri & Ng, 2000). A new movie involves more uncertainty than adding another brand of salty chips in a well-defined category of consumer packaged goods. Fourth, consumer packaged goods are organized in a marketer's mind in a fine grid of market segments, product categories, subcategories, flavors, package types, and so on. This is not the case with movies that are considered in a more holistic way (Dane & Pratt, 2007).

Respondents were told that their decision was very important, that the choice for one of the movies would be irreversible, and that it would cost millions of euros. After receiving a plot synopsis and a film poster for both movies, participants were asked to indicate the extent to which they would select one movie over the other on a slide bar anchored "definitely *Case 39*" on the left and "definitely *Shutter Island*" on the right that corresponded to 0% and 100%, respectively, on an underlying choice continuum. By default, the slide bar knob was located in the middle (50% or indifference between the two movies).

Because of the importance of the case, participants were informed about what a colleague had to say about this issue. Depending on the condition respondents were assigned to, this colleague was either a junior account manager, and thus had the same level of seniority as the respondents, or he or she was a senior account manager, and thus had a higher level of seniority than the respondents. Subsequently, the decision maker received three pieces of advice from the colleague—all favoring the selection of *Shutter Island*—that were justified either by intuition or by analysis. Note that the informative content of the three pieces of advice was the same in all justification conditions. The advice content was as follows:

1. The summary of *Shutter Island* will make many people curious about this movie; I would pick this one.
2. *Case 39* has a good chance of success, but *Shutter Island* will definitely sell more tickets.
3. *Shutter Island* fits in well with hit series such as *Lost* and would have real blockbuster potential.

As in the first two studies, advice that was justified by intuition started with "My gut tells me," "If I go with what my intuition says," or "Intuitively I would say," and was then followed by the content of the advice (1, 2, or 3). In contrast, advice that was justified by analysis started with "The market research data tell me," "If I go with what the consumer data says," or "Judging from the competitor analysis I would say," and was then followed by the content of the advice (1, 2, or 3). Each advice justification form and advice content was used once in a random combination so that a total of three pieces of advice were given to a respondent (three intuitively justified pieces of advice in the intuitive justification condition; three analytically justified pieces of advice in the analytic justification condition). The order of presentation of the pieces of advice was determined at random.

After receiving their colleague's advice, participants were asked again to indicate the extent to which they would recommend to select one movie over the other on a slide bar

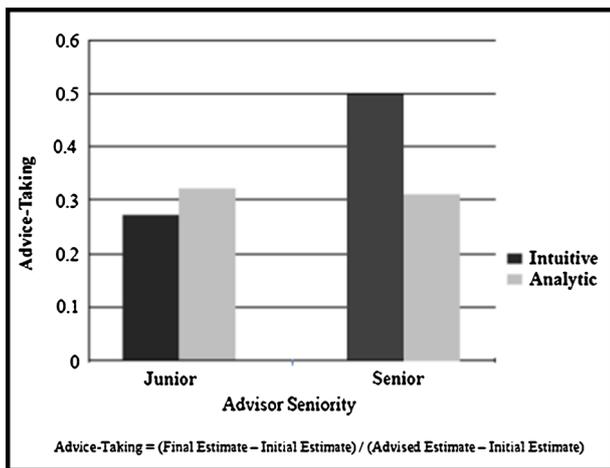


Figure 3. Study 3—mean advice taking values per condition

anchored definitely *Case 39* on the left and definitely *Shutter Island* on the right that corresponded to 0% and 100%, respectively, on an underlying choice continuum. Again, the slide bar knob was initially positioned in the middle.

Results

One hundred and two undergraduate students (75 men and 27 women) participated in this study in return for extra course credit. Data from nine participants (one in the junior advisor/intuitive advice condition; three in the junior advisors/analytic advice condition; four in the senior advisor/intuitive advice condition; one on the senior advisor/analytic advice condition) yielded an undefined value on the Harvey and Fischer (1997) measure and were dropped from the analysis.

The main effects of justification and seniority are not significant here. The interaction effect of advice justification and advisor seniority on advice taking is significant (at a p -level of .10): $F(1, 89) = 3.282$, $p = .07$. In the senior advisor condition, advice taking is .50 for an intuitive justification and .31 for an analytical justification. This difference is significant, $p = .04$. In the junior advisor condition, advice taking is .28 for an intuitive justification and .33 for an analytical justification. This difference is not significant, $p = .60$. Analyzed differently, in the intuitive justification condition, advice taking is .28 for a junior advisor and .50 for a senior advisor. This difference is significant, $p = .02$. In the analytical justification condition, advice taking is .33 for a junior advisor and .31 for a senior advisor. This difference is not significant, $p = .84$. So we can conclude that Hypothesis 3 is confirmed.

Discussion

In this study, we have demonstrated that, on an intuition-inducing task, in this case a movie selection task, the influence of intuitive advice of a senior advisor outweighs the influence of analytic advice. Moreover, the influence of the intuitive advice of a junior advisor is boosted to the same level as the analytic advice (Figure 3), such that there is no

significant difference in advice utilization dependent on the different advice justifications anymore. Again we find that intuitive advice is utilized differentially depending on advisor seniority, but this time we find that intuitive advice outweighs analytic advice for the senior advisor, a stronger result than in Study 2. The most important take-away message from this study is that in certain cases, justifying advice on the basis of intuition can actually be more effective than justifying advice based on analysis.

GENERAL DISCUSSION

Recently, there has been much attention to the distinction between the intuitive and analytical modes of decision making and the question of when each of these two modes yields the best decisions. In this paper, we deal with a related but different question, namely how the intuitive versus analytical *justification* of advice influences the impact of that advice on *others'* decisions.

In our first study, we had a new product go/no-go decision task and an advisor who is at the same level of seniority as the decision maker. We found that if the advice is justified by intuition, the respondents discount it completely. They follow the advice even significantly less than in the situation of no advice justification at all (control group). If the advice is justified by analysis, the respondents do significantly update their opinion in the direction of the advice.

In the second study, the decision task is identical to the first (new product go/no-go decision), but now we manipulate the seniority of the person giving the advice. The advisor is either a junior manager, like the decision maker, or a senior manager. We found that if decision makers received advice from a junior advisor, intuitively justified advice was completely discounted, whereas analytically justified advice resulted in an opinion change in the direction of the advice. However, if the advice was given by a senior advisor, there was no significant difference in advice utilization between an intuitively justified advice and an analytically justified advice. To put it differently, utilization of intuitive advice depended on advisor seniority, whereas the use of analytic advice did not depend on seniority.

The third study again yielded an interaction effect showing that utilization of intuitive advice depended on advisor seniority, whereas the use of analytic advice did not significantly depend on seniority. In this study, however, we shifted to a much more intuition-inducing task. In this task, we found a general increase in the utilization of intuitively justified advice, to such an extent that with a senior advisor, intuitively justified advice had more impact than analytically justified advice, and that with a junior advisor, analytically justified advice was no longer superior to intuitively justified advice.

From these three studies, we can conclude the following. (i) Advice justification has a strong influence on the utilization of the advice. (ii) A priori, decision makers are not inclined to follow an intuitively justified advice. (iii) This resistance is mitigated by seniority of

the advisor. (iv) This mitigation can be so strong that when given by a senior advisor, intuitive justification of advice in some situations can have a higher impact on decisions than analytical justification.

It is interesting to observe that the weights that decision makers attach to intuitively justified advice run parallel to what we know about the situations where intuitive decision making is actually most effective. As we mentioned earlier, research has shown that senior managers do have better intuitions than junior managers (Wagner 1987), and that for specific types of problems (intuition-inducing problems), an intuitive approach is more effective than an analytical approach (Hammond et al., 1987; McMakin & Slovic, 2000). We found that exactly in these conditions decision makers give most weight to an intuitively justified advice. Thus, it seems that decision makers have correct insight in when to trust intuition and when not. This is a reassuring finding.

Contribution, implications, and future research

To the best of our knowledge, this is the first study about the use of intuitive advice justification in a managerial setting. In most studies on advice utilization, the decision task is a relatively straightforward numerical estimation task. For example, participants have to estimate the year in which a specific event took place, the weight of another person, or the number of squares in a screen (Gino, 2008; Gino & Moore, 2007; Harries, Yaniv, & Harvey, 2004; Yaniv, 2004; Yaniv & Kleinberger, 2000; Yaniv & Milyavsky, 2007).

Although our findings are interesting, more insight is needed into the boundary conditions of the influence of intuitively justified advice. For example, in our study, we used (business school) students as decision makers. Students are heavily trained in analytical methods, which may make them biased and more favorable towards analysis. It would be interesting to repeat this study with experienced managers. It is quite likely that they have an even greater appreciation for intuition than students do.

Furthermore, in this study, we only considered two different decision tasks, a new product go/no-go decision and a movie selection task. By looking at a broader range of decision tasks, it will be possible to obtain a more systematic and detailed insight in what characteristics of the task trigger the confidence in intuitive advice. For example, does time pressure induce a greater confidence in an intuitive advice (Payne, Bettman, & Johnson, 1988; De Dreu, 2003)? The same is true for the characteristics of the advisor. We only looked at the difference between a junior and a senior advisor, but it would be interesting to also look at other elements, for example, the advisor's fee. People value advice from others more when it costs money than when it is free (Gino, 2008; Sniezek et al., 2004). Would a higher fee also induce a greater confidence in the intuition of the advisor? Other interesting questions are the difference between internal and external advisors, and the gender of the advisor (women often are supposed to have better intuition). In

the present study, we did not find differences between male and female decision makers in the weight that they attach to an intuitive advice, but this may be different for men and women in the role of advisor.

A practical take-away message from this research is that junior managers should be careful with giving intuitive advice. Very likely, they will not be taken seriously. Unless the problem is less defined and weakly structured (intuition inducing), such advice should probably not be utilized at all. Intuitive advice is received much better if the manager has much experience. Intuitive advice is utilized to a different extent depending on other cues in the advice-taking context that hint at the possible accuracy of intuition. Analytic advice, in contrast, seems to be quite robust to the influence of additional cues. Therefore, a junior manager who recently graduated from university is better off giving analytical, logically founded advice.

This study is the first to explore the effects of advice justification on advice taking. Besides its contribution to our knowledge about advice taking, this type of work is also relevant for practice. One area of application is management consulting. Management consulting is a very important activity and accounts for large sums of money. It is important to have more insight in the factors that determine the utilization of such advice. High-quality advice should be utilized, low quality advice not. This paper provides some initial insights. We hope that more research will follow.

REFERENCES

- Alexiev, A. S., Jansen, J. J. P., Van den Bosch, F. A. J., & Volberda, H. W. (2010). top management team advice seeking and exploratory innovation: The moderating role of TMT heterogeneity. *Journal of Management Studies*, 47, 1343–1364.
- Arendt, L. A., Priem, R. L., & Ndofor, H. A. (2005). A CEO-adviser model of strategic decision making. *Journal of Management*, 31(5), 680–699.
- Birnbaum, M. H., & Stegner, S. E. (1979). Source credibility in social judgment: Bias, expertise, and the judge's point of view. *Journal of Personality and Social Psychology*, 37(1), 48–74.
- Blattberg, R. C., & Hoch, S. J. (1990). Database models and managerial intuition: 50% model and 50% manager. *Management Science*, 36(8), 887–899.
- Bonabeau, E. (2003). Don't trust your gut. *Harvard Business Review*, May, 116–123.
- Bonaccio, S., & Dalal, R. S. (2006). Advice taking and decision-making: An integrative literature review and implications for the organizational sciences. *Organizational Behavior and Human Decision Processes*, 101(2), 127–151.
- Bruner, J. S. (1986). Actual minds, possible worlds. Cambridge, MA: Harvard University Press.
- Buchanan, L., & O'Connell, A. (2006). A brief history of decision-making. *Harvard Business Review*, 84(1), 32–41.
- Cianciolo, A. T., Matthew, C., Sternberg, R. J., & Wagner, R. K. (2006). Tacit knowledge, practical intelligence, and expertise. In K. A. Ericsson et al. (eds), *The Cambridge handbook of expertise and expert performance* (pp. 613–32). Cambridge: Cambridge University Press.

- Clancy, K., & Krieg, P. (2007). *Your gut is still not smarter than your head*. Hoboken: John Wiley & Sons.
- Claxton, G. (1998). Knowing without knowing why. *Psychologist*, 11(5), 217–220.
- Dalal, R. S., & Bonaccio, S. (2010). What types of advice do decision-makers prefer? *Organization Behavior and Human Decision Processes*, 112, 11–23.
- Dane, E., & Pratt, M. G. (2007). Exploring intuition and its role in managerial decision making. *Academy of Management Review*, 32(1), 33–54.
- Dawes, R. M., Faust, D., & Meehl, P. E. (1989). Clinical versus actuarial judgment. *Science*, 31, 1668–1674.
- De Dreu, C. K. W. (2003). Time pressure and closing of the mind in negotiation. *Organizational Behavior and Human Decision Processes*, 91, 280–295.
- Dijksterhuis, A. (2004). Think different: The merits of unconscious thought in preference development and decision making. *Journal of Personality and Social Psychology*, 57(5), 586–598.
- Dijksterhuis, A., Bos, M. W., Nordgren, L. F., & Van Baaren, R. B. (2006). On making the right choice: The deliberation-without-attention effect. *Science*, 311, 1005–1007.
- Dreyfus, H. L., & Dreyfus, S. E. (1988). *Mind over machine: The power of human intuition and expertise in the era of the computer* (2nd edition). New York: Free Press.
- Epstein, S. (1994). Integration of the cognitive and the psychodynamic unconscious. *American Psychologist*, 49, 709–724.
- Feng, B., & MacGeorge, E. (2006). Predicting receptiveness to advice: Characteristics of the problem, the advice-giver, and the recipient. *Southern Communication Journal*, 71(1), 67–85.
- Gino, F. (2008). Do we listen to advice just because we paid for it? The impact of advice cost on its use. *Organizational Behavior and Human Decision Processes*, 107(2), 234–245.
- Gino, F., & Moore, D. A. (2007). Effects of task difficulty on use of advice. *Journal of Behavioral Decision Making*, 20(1), 21–35.
- Gobet, F., & Chassy, P. (2009). Expertise and intuition: A tale of three theories. *Minds and Machines*, 19(2), 151–180.
- Guenther, H. V. (1958). The levels of understanding in Buddhism. *Journal of the American Oriental Society*, 78, 19–28.
- Hammond, K. R., Hamm, R., Grassia, J., & Pearson, T. (1987). Direct comparison of the efficacy of intuitive and analytical cognition in expert Judgment. *IEEE Transactions on Systems, Man, and Cybernetics*, 17(5), 753–770.
- Hammond, K. R. (1996). *Human judgment and social policy: Irreducible uncertainty, inevitable error, unavoidable injustice*. New York: Oxford University Press.
- Harries, C., Yaniv, I., & Harvey, N. (2004). Combining advice: the weight of a dissenting opinion in the consensus. *Journal of Behavioral Decision Making*, 17(5), 333–348.
- Harvey, N., & Fischer, I. (1997). Taking advice: Accepting help, improving judgment, and sharing responsibility. *Organizational Behavior and Human Decision Processes*, 70(2), 117–133.
- Hassin, R. R., Uleman, J. S., & Bargh, J. A. (eds). (2005). *The new unconscious*. New York: Oxford University Press.
- Hayashi, A. M. (2001). When to trust your gut. *Harvard Business Review*, February, 59–65.
- Hogarth, R. M. (2001). *Educating intuition*. Chicago: The University of Chicago Press.
- Jonassen, D. H. (2000). Toward a design theory of problem solving. *Educational Technology Research and Development*, 48(4), 63–85.
- Jungermann, H., & Fischer, K. (2005). Using expertise and experience for giving and taking advice. In C. Betsch, & S. Haberstroh (eds), *The routines of decision-making* (pp. 1157–173). Mahwah: Lawrence Erlbaum.
- Kahneman, D. (2003). A perspective on judgment and choice—mapping bounded rationality. *American Psychologist*, 58(9), 697–720.
- Kennedy, J., Kleimutz, D. N., & Peecher, M. E. (1997). Determinants of the justifiability of performance in ill-structured audit tasks. *Journal of Accounting Research*, 35, 105–123.
- Khatri, N., & Ng, H. A. (2000). The role of intuition in strategic decision making. *Human Relations*, 53, 57–86.
- Kotler, P. (1971). *Marketing decision making: A model building approach*. New York: Holt, Rinehart and Winston.
- Kruglanski, A. W., & Gigerenzer, G. (2011). Intuitive and deliberative judgments are based on common principles. *Psychological Review*, 118(1), 97–109.
- Langer, E., Blank, A., & Chanowitz, B. (1978). The mindlessness of ostensibly thoughtful action: The role of “placebic” information in interpersonal interaction. *Journal of Personality and Social Psychology*, 36(6), 635–642.
- Lilien, G. L., & Rangaswamy, A. (2004). *Marketing engineering: Computer-assisted marketing analysis and planning* (2nd Edition). Victoria: Trafford Publishing.
- Lilien, G. L., & Rangaswamy, A. (2008). *Marketing engineering: models that connect with practice*. In B. Wierenga (ed), *Handbook of marketing decision models*. Boston: Springer Chapter 16.
- McDonald, M. L., & Westphal, J. D. (2003). Getting by with the advice of their friends: CEOs advice networks and firms’ strategic responses to poor performance. *Administrative Science Quarterly*, 48, 1–32.
- McMakin, J., & Slovic, P. (2000). When does explicit justification impair decision making? *Applied Cognitive Psychology*, 14, 527–541.
- Önkal, D., Goodwin, P., Thomson, M., Gönül, S., & Pollock, A. (2009). The relative influence of advice from human experts and statistical methods on forecast adjustments. *Journal of Behavioral Decision Making*, 22, 390–409.
- Payne, J. (1982). Contingent decision behavior. *Psychological Bulletin*, 92, 382–402.
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1988). Adaptive strategy selection in decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 14, 534–552.
- Promberger, M., & Baron, J. (2006). Do patients trust computers? *Journal of Behavioral Decision Making*, 19, 455–468.
- Russo, J. E., & Schoemaker, P. J. H. (1989). *Decision traps: Ten barriers to brilliant decision-making and how to overcome them*. New York: Doubleday.
- Russo, J. E., & Schoemaker, P. J. H. (2002). Winning decisions: How to make the right decision in the first time. *Journal of Economic Psychology*, 24(6), 795–797.
- Schrah, G. E., Dalal, R. S., & Sniezek, J. A. (2006). No decision-maker is an island: Integrating expert advice with information acquisition. *Journal of Behavioral Decision Making*, 19(1), 43–60.
- Shapiro, R. D. (2000). *Procter & Gamble Italy: The Pringles Launch* (A). Harvard, MA: Harvard Business School Case, pp. 601–070.
- Shapiro, S., & Spence, M. T. (1997). Managerial intuition: A conceptual and operational framework. *Business Horizons*, 63–68.
- Simon, H. A. (1989). *Models of thought*. New Haven, CT: Yale University Press.
- Slooman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin*, 119, 3–22.
- Slovic, P., Fleissner, D., & Bauman, W.S. (1972). Analyzing the use of information in investment decision making. *Journal of Business*, 45(2), 283–301.
- Sniezek, J. A., & Buckley, T. (1995). Cueing and cognitive conflict in a judge–advisor system. *Organizational Behavior and Human Decision Processes*, 62, 159–174.
- Sniezek, J. A., & Van Swol, L. M. (2001). Trust, confidence, and expertise in a judge–advisor system. *Organizational Behavior and Human Decision Processes*, 84(2), 288–307.
- Sniezek, J. A., Schrah, G. E., & Dalal, R. S. (2004). Improving judgement with prepaid expert advice. *Journal of Behavioral Decision Making*, 17(3), 173–190.

- Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate?. *Behavioral and Brain Sciences*, 23, 645–726.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124–1131.
- Van Swol, L. M., & Snizek, J. A. (2005). Factors affecting the acceptance of expert advice. *British Journal of Social Psychology*, 44, 443–461.
- Vaughan, F. E. (1979). *Awakening intuition*. New York: Doubleday.
- Vroom, V. H., & Jago, A. G. (1988). *The new leadership: Managing participation in organizations*. Englewood Cliffs: Prentice-Hall.
- Wagner, R. K. (1987). Tacit knowledge in everyday intelligent behavior. *Journal of Personality and Social Psychology*, 52(6), 1236–1247.
- Wierenga, B., & Van Bruggen, G. H. (2000). *Marketing management support systems: Principles, tools, and implementation*. Boston: Kluwer Academic Publishers.
- Wierenga, B., Van Bruggen, G. H. & Althuisen, N. A. P. (2008). Advances in marketing management support systems. In B. Wierenga (Eds), *Handbook of marketing decision models* (pp. 561–592). New York: Springer Science.
- Wilson, T. D., & Schooler, J. W. (1991). Thinking too much: Introspection can reduce the quality of preferences and decisions. *Journal of Personality and Social Psychology*, 60(2), 181–192.
- Yaniv, I. (2004). Receiving other people's advice: Influence and benefit. *Organizational Behavior and Human Decision Processes*, 93(1), 1–13.
- Yaniv, I., & Foster, D. P. (1997). Elimination and inclusion procedures in judgment. *Journal of Behavioral Decision Making*, 10, 211–220.
- Yaniv, I., & Kleinberger, E. (2000). Advice taking in decision making: Egocentric discounting and reputation formation. *Organizational Behavior and Human Decision Processes*, 83(2), 260–281.
- Yaniv, I., & Milyavsky, M. (2007). Using advice from multiple sources to revise and improve judgments. *Organizational Behavior and Human Decision Processes*, 103(1), 104–120.

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