The Ambivalence of Expert Categorizers

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Abstract

We explored people's reactions to expert categorizers who expressed difficulty in making a categorization decision. Specifically, we compared people's impressions of expert health professionals who either expressed certainty, uncertainty, or ambivalence about a categorization decision in the form of a diagnosis. We found that ambivalence resulted in the most negative impressions of these experts, including lower ratings of competence and decisiveness (Experiment 1). Impressions of ambivalence did not improve when the complexity of the decision was explicitly manipulated (Experiment 2). Implications for categorization are discussed.

Keywords: expert; categorization; decision-making; ambivalence.

Introduction

People view the world as existing in clear, definable categories (Gelman, 2003). For example, when attempting to identify a bird sitting in our yard, we take as granted that there are clear delineations between different species of birds and that with enough knowledge a given bird can be neatly categorized into its appropriate category (Diesendruck & Gelman, 1999; Estes, 2003). Believing the natural world is organized and divided in this way suggests that there are right answers to categorizing things that are accessible given enough knowledge. The people we turn to that possess this knowledge we call experts. Laypeople perceive that for different domains in the world, experts exist and possess knowledge specific to that domain (Wilson & Keil, 1998). People defer to these experts when information or a decision is needed (Braisby, 2001, 2003; Danovitch & Keil, 2004; Danovitch & Keil, 2007; VanderBorght & Jaswal, 2009). This deference has been described as a division of cognitive labor that allows a given person to be able to interact with elements of the world she does not understand because of the belief that there are experts that exist that do understand those elements (for a discussion see Wilson & Keil, 1998).

Experts play an obviously important role in allowing people to survive in the modern world. Given the importance of experts, what happens when an expert expresses difficulty in making a categorization decision? For example, imagine a mechanic who can not decide if a car is malfunctioning because of a transmission problem or because of an exhaust problem, or a bird authority who cannot decide which of two species is the correct categorization for a bird, or a doctor who is torn between two possible diagnoses for a patient. In short, how do we react to these experts who we have turned to for help when they express difficulty in making a categorization decision? Furthermore, are there differences in our reactions, depending on the type of difficulty experts are expressing? We delineate three different possible states a person making a categorization decision could experience: knowing the correct answer (certainty), not being clear at all as to what the correct answer is (uncertainty), and having narrowed the correct answer down but feeling tension and conflict as to which answer is the correct choice (ambivalence). In our study, we are specifically interested in this state of ambivalence. In the following we describe how people may react to ambivalent experts and then contrast this with possible reactions to uncertain experts.

How do we react to an expert who expresses being ambivalent about a categorization decision in her domain of expertise? One possibility is that ambivalence in experts is not perceived as problematic, but instead as a sign of effective decision-making. Seeing an expert express being torn over the correct categorization may verify our initial deference; this is a complex decision that is beyond our ability. Furthermore, expressions of ambivalence are often taken as a positive sign of more deliberative, and flexible thinking (Rothman, 2011). In addition, experiencing ambivalence is related to more creative (Fong, 2006) and more accurate (Rees, Rothman, Lehavy, & Sanchez Burks, 2013) final decision-making. As such, an expert categorizer who is torn between placing something in one of two categories may be seen as a creative, deep thinker and valued for her expertise.

We believe it is much more likely that people react negatively to ambivalent experts. People largely act as if categories in the world exist with clear, delineable boundaries. That is, something is not partially a bird, or part of the bird *and* cat category. This belief in clear categorical boundaries has been linked to essentialism, or belief that a category has a causal essence that underlies the category, creates the features of that category, and must be possessed to be a member of that category (Gelman, 2003). Previous work has claimed that it is exactly this belief that categories possess essences that allows us to be willing to defer to experts in making a categorization decision; people are believed to defer to experts because they believe experts have the correct knowledge to recognize and identify the

causal essences that underlie category membership (Braisby, 2001; 2003). Now imagine this expert who is supposed to be able to recognize the essence underlying categorization being torn as to which of two categories something belongs. Because of the implications of essentialism, category membership should be all-or-none, with the item to be categorized only being in one of the two possible categories.[1] Also, if anyone should be able to identify that causal essence, it should be this expert. In this way, an expert expressing ambivalence may elicit negative reactions because ambivalence does not mesh well with our beliefs about essences and the ability of experts to identify those essences. For these reasons, we predict that experts expressing ambivalence in making a categorization decision should be viewed negatively.

An interesting alternative to ambivalence in categorization decision-making is uncertainty. Previous literature on decision-making has distinguished uncertainty and ambivalence as two separate emotional and decisional states. Uncertainty is a state of not knowing the correct answer to a problem, whereas ambivalence reflects a state of being torn between two possible alternatives (Rothman, 2011). Said another way, a decision maker may be uncertain because not enough information is known to make a decision or because the person does not have enough expertise to know the correct answer. However, a decision maker who is ambivalent appears to have all of the information needed to make a decision but is torn between two possibilities. In our paradigm using expert decision makers, we predict that an uncertain expert may look like someone who just needs more information before a decision is possible. However, an ambivalent expert will seem to have all or at least more of the needed information since she is actively considering two possibilities. This should result in the ambivalent expert looking relatively more unable to make correct decisions. If this holds, we would expect that ambivalent experts could be viewed more negatively than uncertain experts.

In the following two experiments, we investigate how people view expert categorizers making a categorization decision. To ensure participants' familiarity with the type of expert categorizer and the decision domain, we presented participants with descriptions of a health professional making a difficult diagnostic decision. Interacting with this type of expert categorizer should be easy for participants to think about. We described the professional as deciding between two possible diagnoses and displaying one of three levels of categorization certainty: certain of the correct diagnosis, completely uncertain as to which of two diagnoses is correct, or torn and conflicted as to which of two diagnoses was correct. We then measured participants' impressions of these expert categorizers.

[1] This is assuming categorization at the same level in a categorization hierarchy and within the same domain. Presumably, any given object can belong to multiple categories along a subordinate to superordinate spectrum (e.g., robin, bird, animal) and can be categorized in different ways depending on the intention of the categorizer (e.g., parakeet versus pet animal). We are discussing here categorization decisions that are equated across these dimensions (e.g., robin versus blue jay).

Experiment 1

In Experiment 1, we manipulated the levels of categorization certainty of an expert decision-maker and then measured people's perceptions of the quality of that decision-maker. If ambivalence is inherently unsettling for the reasons discussed above, participants should view ambivalent experts as lower quality and more indecisive than certain or even uncertain experts. However, if ambivalence is taken as a sign of the expert being thoughtful, then perceptions of these experts should be more favorable.

Methods

Participants Sixty participants recruited through Amazon's Mechanical Turk participated for payment. Participation was restricted to Mechanical Turk workers in the United States.

Materials and Procedure Participants read a description of a hypothetical patient who was seeking advice from a health care professional for an ongoing health problem. Participants read that the patient was given a series of tests, the results of which suggested two potential diagnoses, labeled A and B. Participants were randomly assigned to read one of three statements that described the health professional as being certain the patient had diagnosis A and not B (Certain condition; n = 20), uncertain as to whether diagnosis A or B was correct (Uncertain condition; n=18), or torn as to whether diagnosis A or B was correct (Ambivalent condition; n = 22). We used the torn descriptor for the ambivalent condition because it conveys how the subjective state of ambivalence is likely to be expressed (see Rothman, 2011 for a more detailed discussion of this point). Participants were randomly assigned either to read that the person was seeking help from a physician and the diagnosis was one of two infections (n = 27) or was seeking help from a mental health clinician and the diagnosis was one of two mood disorders (n = 33). After reading the health interaction description, participants completed a series of different ratings that asked them to rate the provider on different dimensions or rate how a patient would react to the provider. We were specifically interested in three issues: how indecisive and how competent the provider from the previous exchange was seen to be, as well as how positively or negatively participants reacted to the provider. Indecisiveness was measured by asking participants to rate to what extent the physician possessed a series of personality traits, in which were embedded the following 8 traits related to indecision: Confused, Unsure, Uncertain, Indecisive, Hesitant, Not Definite, Faltering, and Wavering. Mean ratings across these 8 measures were used as a measure of indecisiveness. To measure competence, we asked participants to rate their agreement with a series of

statements assessing how likely they thought the physician would be to engage in a series of behaviors related to being well informed (mean of three statements: attend professional conferences, be aware of current research, be asked for an opinion by other professionals) and be seen as a quality practitioner (mean of three statements: be a high quality expert, make accurate diagnoses, create accurate treatment plans). We also measured participants' predictions of how a patient would react to the given expert through ratings of how likely the patient would be to recommend that others defer to this expert (mean of three statements: refer a friend to the health care professional, provide a strongly positive rating on a referral website, take his/her children to see this health care professional) and how likely the expert would be to be sued by a patient (assessed through a single question). These ratings were intermixed with other ratings of the professional that were unrelated to the measures we discuss here. All ratings were made on seven-point agreement scales with the exact anchor points of the scales varying by task (e.g., Not at all likely to Extremely likely).

Participants also made ratings related to behaviors of the patient, but we do not present those results here and these measures are not discussed further. The order of rating tasks was randomized for each participant.

Results

There were no significant differences between the mental and medical health professionals on any of our measures, *p*s > .12. As such, we collapsed across that manipulation. For all of the following analyses, we conducted one-way ANOVAs with categorization certainty (Ambivalent, Certain, Uncertain) as a between-subjects variable.

Decision Indecisiveness We first assessed perceptions of the expert's indecisiveness. We compared the mean ratings for participants in the ambivalent condition to ratings in the certain and uncertain conditions. Participants' perceptions of the expert's indecision differed significantly by condition, $F(2, 57) = 14.43$, $p < .001$. Planned contrasts demonstrated that the Ambivalent physician was judged as significantly more indecisive ($M = 4.45$, SD = 1.31) than the Certain physician ($M = 2.47$, SD = 0.94; $t(57) = 5.36$, $p < .001$). Interestingly, the Ambivalent expert was also perceived as significantly more indecisive than the Uncertain physician ($M = 3.62$, SD = 1.30; $t(57) = 2.19$, $p = .033$). Not surprisingly, the Uncertain physician was perceived as more indecisive than the Certain physician, $t(57) = 2.95$, $p = .004$.

Expert Competence Participants' perceptions of the expert's level of being informed differed significantly by condition, $F(2, 57) = 6.19$, $p = .004$. Planned contrasts demonstrated that the Uncertain and Certain experts were seen as equally informed, $p = .43$. However, the Ambivalent expert was judged as significantly less well informed ($M = 4.14$, SD = 1.29) than the Certain expert ($M = 5.33$, SD = 0.97; $t(57) = 3.37$, $p = .001$), or Uncertain expert ($M = 5.04$, SD = 1.15; $t(57) = 2.46$, $p = .017$).

Similar results obtained with perceptions of the expert's quality. Expert's perceived quality differed significantly by condition, $F(2, 57) = 5.39$, $p = .007$. Planned contrasts found that Uncertain and Certain experts were seen as equal in quality, $p = .37$. As predicted, the Ambivalent expert was judged as significantly lower quality ($M = 3.89$, SD = 1.24) than the Certain physician ($M = 4.77$, SD = 1.34; $t(57) = 2.29$, $p = .026$) or the Uncertain physician ($M = 5.13$, SD = 1.10; $t(57) = 3.15$, $p = .003$).

Reactions to the Expert Participants' perceptions of whether the patient would refer the expert differed significantly by condition, $F(2, 57) = 12.17$, $p < .001$. Planned contrasts demonstrated that the Ambivalent expert was judged as significantly less likely to be referred ($M = 2.73$, SD = 1.11) than the Certain expert ($M = 4.47$, SD = 1.32; $t(57) = 4.74$, $p < .001$). The Ambivalent expert was also perceived less likely to be referred than the Uncertain expert ($M = 4.02$, SD = 1.13; $t(57) = 3.42$, $p = .001$). Predicted referrals did not differ for the Uncertain and Certain experts, $p = .25$.

Participants' ratings of the likelihood the expert would be sued differed significantly by condition, $F(2, 57) = 7.54$, $p = .001$. Planned contrasts demonstrated that the Ambivalent expert was judged as significantly more likely to be sued ($M = 4.86$, SD = 1.52) than the Certain expert ($M = 3.15$, SD = 1.46; $t(57) = 3.77$, $p < .001$). The Ambivalent expert was judged as more likely to be sued than the Uncertain expert ($M = 3.67$, SD = 1.41; $t(57) = 2.56$, $p = .013$). Likelihood to be sued did not differ for Certain and Uncertain experts, $p = .28$.

Discussion

Our results show that ambivalent experts are perceived uniformly more negatively than certain and uncertain experts. If this negative impression was just in reaction to the expert being anything but completely certain in his/her decision making, then we would expect to see uncertain experts being viewed more in line with ambivalent experts. Our findings instead support that uncertainty does not produce the same negative reactions as ambivalence. In fact uncertain experts were viewed as positively as certain experts, except for not surprisingly being viewed as more indecisive. One explanation for this finding is that uncertainty is interpreted as a case in which more information is simply needed before a decision can be made, rather than a sign of ineptitude. Conversely, ambivalence may be interpreted as a case in which all of the information is available, but the expert is simply inept. It is a question for future research as to whether these interpretations are what are driving our demonstrated results.

Given previous research on the benefits of ambivalence to the decision-making process (e.g., Fong, 2006; Rees et al., 2013), it may seem surprising that ambivalence is viewed so negatively. As we discussed earlier, laypeople may assume that categories exist and can be identified as long as the person has enough expertise. As such, experts should be

able to do this task easily. However, when experts express ambivalence (even more so than uncertainty), it appears from our results that such an expression conveys the expert's inability to make a decision. It seems possible, however, that such negative responses to ambivalent experts may be alleviated when the decision is described as complex. That is, because ambivalence is a typical reaction to complexity (e.g., Larsen, McGraw, & Cacioppo, 2001; Tiedens & Fong, 2002), expressed ambivalence may be more palatable to observers when observers are told that the decision/diagnosis is complex rather than simple. This may obtain because complexity provides a causal explanation for any ambivalence that is experienced (i.e., this is a complex case and it therefore makes sense it is hard to distinguish between two alternatives). This explanation may in turn make the decision-maker seem more justified for expressing the state of ambivalence (see Ahn, Novick, & Kim, 2003). The same may hold true for expressions of uncertainty. However, this complexity could actually negatively influence impressions of certain experts because it may be difficult to understand how an expert is so certain even when the problem is complex. To investigate this possibility, we manipulated the stated complexity of the decision task in Experiment 2.

In Experiment 1 we ended the description of the health care interaction before a final diagnosis was provided. We did this because we were interested in how the expression of ambivalence is interpreted as it is first encountered, regardless of what decision the expert finally comes to. However, an alternative explanation for our results is that the certain provider was viewed more favorably than the ambivalent provider because the certain provider was perceived to have actually suggested a diagnosis whereas the ambivalent provider had not.[2] In Experiment 2 we accounted for this issue by adding – across all conditions -- the delivery of an actual diagnostic decision at the end of the health care interaction. It is possible that providing a diagnosis may make all decision states seem equally unproblematic; people may not care how an expert decision-maker arrives at a decision once the decision is final. If this is true, perceptions of ambivalent experts may be equated to certain and uncertain experts. However, if people are focused on the process by which the decision maker arrives at a decision, then providing an actual diagnosis may not matter for the effects of certainty.

Experiment 2

Experiment 2 expands from the basic design of Experiment 1 by equating all conditions on the delivery of a final diagnosis. We used the same manipulations as in Experiment 1 but added that all providers came to the same final diagnosis at the end of the interaction. We also manipulated the described complexity of the decision in Experiment 2, such that we would be able to assess if describing a categorization decision as complex changes how ambivalence is perceived. As such, in the following analyses we will compare the effects of complexity within each certainty manipulation to see if it differentially influences impressions of each expressed decision state.

Methods

Participants Ninety-two United States based participants recruited from Amazon's Mechanical Turk participated for payment.

Materials and Procedure The same basic materials and procedure was used as in Experiment 1 with the following exceptions. Because no differences were found between medical and mental health experts in Experiment 1, we used only medical experts. In addition, we manipulated the complexity of the decision: half of the participants received information that the diagnostic decision was complex in nature (Complex condition; n = 47). The remaining participants did not receive this additional information (Control condition). Finally, all participants read that the physician made a decision of one diagnosis at the end.

After reading the description, participants went on to make the same ratings as in Experiment 1 related to their perceptions of the health care provider and the patient's follow up behaviors. To measure participants' conceptions of how long people spend in different certainty states during decision-making, we asked the following: "Think about the amount of time between learning about a problem and announcing a decision related to that problem. What percent of the time do people typically experience the following states in that time period?". Participants made ratings for three states: certain, uncertain, and torn and conflicted. For each state, participants dragged a slider bar to indicate the percentage time spent in that state, with percentages for all three states adding to 100. Participants made these ratings once with the above prompt and then again while thinking of a complex decision. Finally, participants completed a series of post-test measures that asked them to indicate if they were a health care professional, how difficult they believed medical issue diagnosis to be, the level of expertise required to practice for several different types of medical professionals, an assessment of their desire to have final decisions (i.e., the Need for Closure scale), and their political leanings. For space purposes, we do not report the findings of the time spent deciding measure or the post-test measures.

Results and Discussion

For the following analyses, we conducted 3 (Categorization Certainty: Ambivalent, Certain, Uncertain) x 2 (Complexity: complex vs. control) between-subjects ANOVAS with simple effects analyses within each certainty level comparing the complexity conditions. Bonferroni corrections were used in all of these analyses. In all ANOVAs, there was a significant main effect of Categorization Certainty, suggesting that adding the actual

[2] It should be noted that this explanation does not account for differences between the ambivalent and uncertain conditions.

diagnosis did not equate impressions of experts across the certainty manipulation. Importantly, in all ANOVAs we found a significant interaction between Categorization Certainty and Complexity. For simplicity sake, we focus on these interactions and present only the follow up simple effects analyses. Figure 1 depicts these analyses.

We first analyzed whether describing a decision process as complex altered perceptions of experts expressing uncertainty. Impressions of Uncertain experts were more positive when the decision was described as complex relative to the control condition: They were seen as marginally less indecisive ($M = 4.07_{control}$, SD = 1.54 vs. M = 3.33, SD = 1.10; p = .098), more informed ($M = 3.31_{control}$, SD = 1.05 vs. M = 4.73, SD = 1.50; p = .002), and higher quality ($M = 2.16_{control,}$ SD = 0.94 vs. M = 4.20, SD = 1.45; p < .001). Predicted patient reactions to Uncertain experts were more positive in the complex condition in that patients were seen as more likely to refer them to friends ($M = 2.67_{control,}$ SD = 1.35 vs. M = 4.16, SD = 1.23; p = .002) and less likely to sue ($M = 5.67_{control}$, SD = 1.35 vs. M = 4.13, SD = 1.89; p = .008).

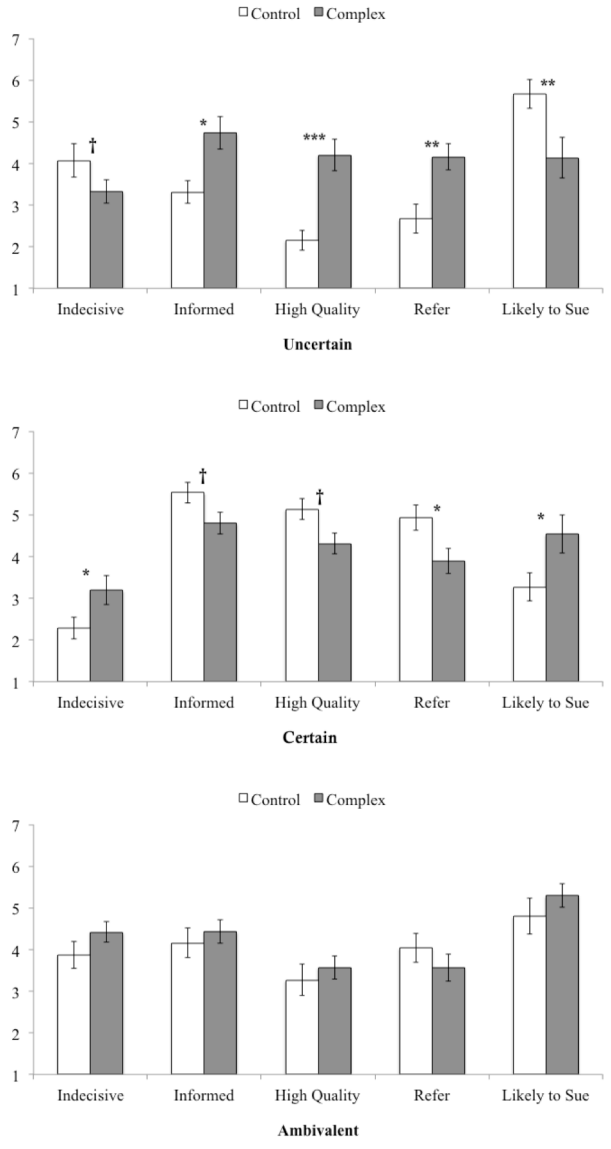

Figure 1: Mean ratings across certainty conditions. * indicates p<.05, ** indicates p<.01, *** indicates p<.001, † indicates .05 < p < .1. Error bars represent standard error.

This effect of complexity was reversed in Certain experts. Certain experts were seen in the Complex condition as more indecisive ($M = 2.28_{control}$, SD = 0.99 vs. M = 3.19, SD = 1.35; p = .042), marginally less informed ($M = 5.53_{control}$, SD = 0.96 vs. M = 4.80, SD = 1.02; p = .095), and marginally lower quality ($M = 5.13_{control}$, SD = 0.098 vs. M = 4.31, SD = 0.96; p = .058). Predicted patient reactions to Certain experts were less positive in the complex condition in that patients were seen as less likely to refer the expert to friends ($M = 4.93_{control}$, SD = 1.18 vs. M = 3.89, SD = 1.15; p = .028), and more likely to sue ($M = 3.27_{control}$, SD = 1.33 vs. M = 4.53, SD = 1.77; p = .028).

Interestingly, complexity of decisions did not alter impressions of Ambivalent experts, with no significant differences obtaining when the diagnosis was described as complex versus not. Ambivalent experts were seen as just as indecisive ($M = 3.87_{control}$, SD = 1.25 vs. M = 4.42, SD = 1.00; p = .20), just as informed ($M = 4.16_{control}$, SD = 1.36 vs. M = 4.43, SD = 1.15; p = .51), and of equal quality ($M = 3.27_{control}$, SD = 1.44 vs. M = 3.57, SD = 1.15; p = .46). Predicted patient reactions did not differ across levels of complexity for likelihood to refer the expert ($M = 4.04_{control}$, SD = 1.37 vs. M = 3.57, SD = 1.35; p = .29) or likelihood to sue ($M = 4.80_{control}$, SD = 1.66 vs. M = 5.29, SD = 1.16; p = .36).

General Discussion

Relying on experts to aid in specialized decisions is a core feature of modern human reasoning. As such, it is vitally important to understand how people think about experts and their decision-making process. We have presented one of the first explorations of impressions of ambivalent experts by investigating how people perceive ambivalent versus certain and uncertain experts within the health domain. In two experiments, we present converging evidence that expressed ambivalence is particularly costly for experts (Experiment 1) and this cost holds regardless of the complexity of the task and the determination of a final categorization decision (Experiment 2). These results suggest that when an expert expresses ambivalence about a categorization decision in his or her area of expertise, observers react negatively to this expert regardless of the complexity of the task and whether a decision is eventually made.

Why do people react so negatively to ambivalence in experts? Thinking about our specific examples, the health care experts in our experiments were ambivalent as to how to classify patients into one of two categories. As discussed earlier, the idea that an expert may have difficulty categorizing something in their area of expertise may go

against our fundamental assumptions of how categories function in the world. If an expert expresses ambivalence in categorizing something within their domain, this may challenge the belief that categories are clearly defined and can be recognized with enough knowledge. In this sense, people may feel uncomfortable with ambivalent experts because they undermine assumptions about the nature of categories in the world that fall from essentialism.

If the negative reaction to ambivalent experts stems from implications of essentialism, then this would imply that ambivalent experts should be more acceptable for categories where essences are not inferred. Medical and mental health categories are seen as possessing causal essences that define the features of the category and are necessarily possessed by members of the category (Ahn, Flanagan, Marsh, & Sanislow, 2006; Cooper & Marsh, in preparation). If we use a domain that was inherently less essentialized, or not essentialized at all (e.g., artifacts, nominal kinds) we may see a shift in perceptions of experts' decision-making process. For example, if we interacted with an expert who could not categorize a man-made object, we may be more accepting of this expert's ambivalence precisely because there is not a defining causal feature by which to organize the object.

A tension has formed: ambivalence improves decision-making (Rees et al., 2013) but is perceived negatively by laypeople when expressed by an expert. This sets up the possible recommendation of telling experts to balance different ideas and be open to feeling ambivalent during decision-making, but under no circumstances express this ambivalence to others. This clearly seems like a less than ideal recommendation given that many experts are expressly charged with communicating their decision-making process to laypeople (e.g., the shared-decision making model of medicine). Further research is needed to understand how experts can convey ambivalence and not upset the laypeople they are tasked to help, as well as to understand for whom (e.g., what types of patients) ambivalence may be more or less palatable.

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