

HEALTHCARE AND MEDICAL DECISION MAKING

Empowering Consumers to Engage with Health Decisions: Making Medical Choices Feel Easy Increases Patient Participation

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ABSTRACT Although modern medical practice emphasizes the importance of empowering consumers to participate in medical decisions, consumers often report having less say than they desire. Three experiments demonstrate that increasing the fluency with which medical decisions are communicated can increase participation: consumers were more likely to participate in medical treatment decisions (vs. delegate to a medical professional) when information about their options was presented in a fluent (vs. disfluent) format. Fluency increases participation by increasing subjective comprehension (i.e., by making people feel like they better understand the choice and feel more confident in their ability to choose), independent of objective comprehension. The effect of fluency was strongest among consumers with inadequate health literacy and under time pressure and persisted regardless of past experience. Together, these studies suggest that policies aimed at making medical information easier to process can empower consumers to participate in decisions regarding their health.

Empowering consumers to participate in medical decisions is a cornerstone of personalized, patient-driven medicine, as modern medical practice has come to recognize the benefits of actively engaging consumers in decisions about their health (Katz 1984/2002). Encouraging consumers to voice their preferences can help doctors tailor treatments to fit individuals' differing needs. It can ensure that, when the "right" option is a matter of preference, consumers' own preferences are prioritized over the preferences of their doctors. Moreover, involving consumers in treatment decisions can increase adherence to treatments for conditions that require substantial lifestyle changes (Mendonca and Brehm 1983; van Dam et al. 2003; Loh et al. 2007; Baars et al. 2010; but see also Camacho, De Jong, and Stremersch 2014). In recognition of these benefits, the World Health Organization (1979) has deemed patient participation as not only desirable but a duty and a social, economic, and technical necessity (Waterworth and Luker 1990).

Yet despite the modern emphasis on participation, patients often report not having participated as much as they would like. A review of studies involving patients choosing cancer treatments revealed that patients generally wanted more participation than actually occurred (Tariman et al. 2010). In a study of women with breast cancer, 66% preferred an active or shared role in decision making and only 34% preferred a passive role, but 59% reported actually having a passive role (Degner et al. 1997). In a follow-up 3 years later, the gap between patients' preferred and actual roles slightly grew over the course of their treatment (Hack et al. 2006). In a more recent study of men with prostate cancer, patients' preferences had no discernible influence on the treatment they received (Scherr et al. 2017).

Why might patients so often have less say than they want? Medical decisions are notoriously difficult, not just in their potential consequences but in their complexity, with complicated technical diagnoses (e.g., myocardial infarction), drug

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names (e.g., ixekizumab), and procedures (e.g., electroencephalography), and numerous treatment options (e.g., there are five major classes of and dozens of different formulations of antidepressants). Research in consumer psychology has long recognized that choice difficulty can lead people to avoid participating in decisions (Anderson 2003). They delay choosing (Tversky and Shafir 1992; Dhar 1997a; Luce 1998), retain status quo and default options (Tversky and Shafir 1992; Redelmeier and Shafir 1995; Luce 1998), delegate choices to other people (Steffel, Williams, and Perrmann-Graham 2016; Barasz and Ubel 2018; Steffel and Williams 2018), or opt not to choose anything (Dhar 1997b; Iyengar and Lepper 2000).

Participation in decision making may depend not only on the difficulty of the choice but also on the fluency (vs. disfluency) with which the choice is communicated (Novemsky et al. 2007; Alter and Oppenheimer 2009; Steffel and Williams 2018). Presenting an already difficult medical decision in a manner that feels difficult to process—whether due to complex medical jargon, overly dense and poorly organized materials, or even difficult-to-read fine print—may reduce participation by undermining consumers' comprehension of the decision in two different ways. One, it may reduce consumers' objective comprehension, that is, their ability to grasp or extract meaning from the information provided (Mick 1992). Two, it may reduce consumers' subjective comprehension, that is, their perception of their ability to extract meaning from the information provided and confidence in their ability to use that information (Mick 1992). We propose that, even if a consumer can objectively understand a medical decision, disfluency may still reduce participation in that decision by making the patient believe that they lack the ability to understand their options and make a good decision. Consumers often avoid choices because the subjective difficulty of these decisions undermines their confidence that they will select the best option (Dhar 1996, 1997a, 1997b; Dhar and Nowlis 1999; Dhar, Nowlis, and Sherman 1999); indeed, this lack of confidence is one of the most commonly cited reasons for why consumers fail to participate in medical decisions (Strull, Lo, and Charles 1984; Singer et al. 2014). Interviews indicate that patients who are more worried about making the “wrong” decision are more likely to want their doctor to choose on their behalf (Charles et al. 1998; Kenny et al. 1999).

McCaffery et al. (2013) proposed that, to help consumers in making medical decisions, patient decision aids must achieve three goals: they must enable patients not only to (1) objectively understand health information relevant to

their decision but also to (2) subjectively believe in their ability to understand their options and choose the option that is best for them and (3) participate in decision making. The bulk of medical research examining interventions designed to improve the fluency with which health information is communicated has focused on their effects on objective comprehension, showing that they tend to increase knowledge, understanding, and risk perception, and some research has demonstrated that they may improve aspects of subjective comprehension like confidence and uncertainty as well (McCaffery et al. 2013). However, little is yet known about the effects of such interventions on participation (McCaffery et al. 2013). We suggest that such interventions may also increase participation, even when consumers accurately understand a decision, by enhancing subjective comprehension. Past research has shown that interventions targeted at subjective comprehension can influence information processing and decision making independent of objective comprehension (Brucks 1985; Mick 1992; Moorman et al. 2004). Relatedly, superficial task features that increase fluency can make people more confident they are performing well on a task even if their true performance is unchanged (Kelley and Lindsay 1993; Alter et al. 2007; Reber, Brun, and Mitterndorfer 2008; Williams, Duke, and Dunning 2020). We predict that increasing the fluency with which health decisions are communicated can increase participation by boosting consumers' subjective comprehension, even when objective comprehension is unchanged. Thus, we predict:

H1: Presenting medical decisions in a fluent versus disfluent format makes consumers more likely to participate in those decisions rather than delegate to a health professional.

H2: Fluency increases participation by boosting consumers' subjective comprehension, independent of objective comprehension.

The present research investigates whether increasing the fluency with which health decisions are communicated can make consumers more likely to participate in those decisions. Study 1 tests whether consumers are more likely to choose a treatment for themselves rather than delegate to health professionals when those decisions are presented in a fluent rather than disfluent format. We also test individual characteristics that might moderate the effect of fluency on participation, specifically, health literacy and prior experience. Study 2 explores whether situational characteristics

like time pressure moderate the effect of fluency on participation. Study 3 shows that subjective comprehension underlies the relationship between fluency and participation, independent of objective comprehension. We report all measures, conditions, and data exclusions, and we set target sample sizes and stopping rules before data collection. Our data are available at https://osf.io/4p9he/?view_only=970f5d02de8248cca67b9e92b7d8d613.

This research contributes to an understanding of several health and consumer-related topics. Our work answers a call from McCaffery et al. (2013) to address the effects of fluency interventions on patient participation, a critical and yet understudied aspect of patient empowerment. We extend research on individual differences in abilities and capacities in medical contexts by showing how they interact with contextual features like how medical choices are communicated, and suggest that situational factors, such as time pressure, can shift how fluency of presentation affects participation. We further show that subjective comprehension, independent of objective comprehension, is the route by which fluency increases participation, extending prior work by showing that subjective comprehension not only influences information processing and decision strategies, but also, participation. Finally, our research offers practical recommendations for how medical professionals and policy makers can empower consumers to advocate for themselves in decisions regarding their health.

STUDY 1: CAN INCREASING FLUENCY INCREASE PATIENT PARTICIPATION?

Study 1 examines whether presenting medical choices more simply can make consumers more likely to participate. Participants encountered a choice between medications that were presented in a simple table format or a dense paragraph format. Participants indicated whether they would choose a medication themselves or delegate to a pharmacist. We predicted that participants would be more likely to choose themselves when the options were presented in a fluent format than in a disfluent format.

This study also explores how individual characteristics may contribute to participation. Health literacy—that is, consumers' baseline ability to process health-related information to make informed decisions—may affect consumers' sensitivity to fluency. Patients with inadequate health literacy find health decisions more challenging and are more likely to rely on surrogates than those with adequate health literacy (Ishikawa and Yano 2008, 2011). Moreover, people with the lowest levels of literacy tend to benefit the most from

graphic rather than textual presentation of health information (Viswanathan, Hastak, and Gau 2009). Separately, past experience with a particular medical decision also may affect people's sensitivity to fluency. Consumers without prior experience with a particular medical condition often prefer to take a more passive role, and for their doctors to take a more active role, than patients with prior experience (Degner et al. 1997; Mansell et al. 2000). This study tests whether health literacy and prior experience influence participation and whether they moderate the effect of fluency on participation.

Method

Participants. Four hundred and two adults (214 male, 176 female, 12 unspecified; $M_{age} = 33.70$; 319 White, 26 Black, 20 Asian, 19 Hispanic, 6 other ethnicity/race, and 12 unspecified) were recruited via Amazon Mechanical Turk (MTurk) and paid \$0.30 to participate.

Procedure. Participants imagined that they had been suffering from heartburn and were shopping for medication to alleviate their symptoms. Participants received information about three types of over-the-counter heartburn medications—antacids, acid reducers, and proton-pump inhibitors—including brands, usage instructions, relief duration, and potential side effects. This information was presented in a simple table format (*fluent* condition) or in a dense paragraph format (*disfluent* condition; see app. A for full materials; apps. A–H available online).

A pretest verified that the fluency manipulation affected how easy or difficult it felt to use the information about the medications. Twenty-four MTurk participants rated how easy or difficult both presentation formats were to use on a scale ranging from 1 = very easy to 10 = very difficult. Participants rated the table format as easier to use ($M = 1.33$, $SD = .70$) than the paragraph format ($M = 7.00$, $SD = 2.04$; paired $t(23) = 11.80$, $p < .001$, $d = 9.25$).

We also ran a pretest to verify that participants objectively comprehended the information equally well regardless of the format complexity. Sixty MTurk participants considered the scenario in either the table or paragraph format and answered three comprehension questions (i.e., “When should you take acid reducers, like Pepcid AC or Zantac 75?”; “What is the duration of relief for proton-pump inhibitors, like Prilosec?”; and “What are the potential side effects of antacids, like Tums or Rolaids?”). Most participants answered all questions correctly in both the disfluent (90%)

and fluent conditions (84%; $\chi^2(1, N = 60) = .43, p = .51, \phi = .09$).

Participants learned that the pharmacist said that some of these drugs might be a better fit for some people than others, but that the pharmacist would be glad to choose a drug for them if they thought it would be helpful. Participants then chose whether they would want to (1) consider their options and purchase whichever medication they thought was best, and indicate which medication they preferred or (2) tell the pharmacist which of the options they were considering and purchase whichever medication the pharmacist thought was best. Next, participants completed the newest vital sign (NVS) health literacy assessment (Weiss et al. 2005), one of the most common measures of health literacy. The NVS measures health literacy by testing how well participants can extrapolate health-relevant information from a nutrition label. Finally, participants indicated whether they had purchased heartburn medication before as a measure of prior experience, as well as their gender, age, and ethnicity/race.

RESULTS

Participants were more likely to choose a medication themselves than delegate to the pharmacist when information about the medications was presented in a simple table format (51%) versus a dense paragraph format (39%; $\chi^2(1, N = 402) = 6.14, p = .01, \phi = .12$).

People with inadequate health literacy were more affected by the fluency with which choices were presented than those with adequate health literacy. Of those who completed the NVS health literacy assessment ($N = 398$), 90% demonstrated adequate health literacy (i.e., they scored 4–6 out of 6; Weiss et al. 2005), and 10% did not. Participants were more likely to choose themselves in the fluent condition than in the disfluent condition (Wald's $\chi^2 = 5.80, p = .02$, odds ratio = .61), but the main effect of health literacy on delegation was not significant (Wald's $\chi^2 = .64, p = .42$, odds ratio = .76). Importantly, however, there was an interaction between fluency and literacy (Wald's $\chi^2 = 4.23, p = .04$, odds ratio = 5.27): participants with inadequate health literacy were more likely to choose themselves in the fluent condition (60%) than in the disfluent condition (17%; $\chi^2(1, N = 38) = 7.45, p = .006, \phi = .44$), but this effect was attenuated among those with adequate health literacy (50% vs. 42%; $\chi^2(1, N = 360) = 2.78, p = .10, \phi = .09$). Examined differently, when the information was fluent, participants with inadequate health literacy were equally likely to choose themselves as those with adequate health literacy ($\chi^2(1, N = 197) = .68, p = .41, \phi = .06$), but when it was

disfluent, participants with inadequate health literacy were less likely to choose themselves than those with adequate health literacy ($\chi^2(1, N = 201) = 4.25, p = .04, \phi = .15$).

People with past experience with heartburn medications were more likely to choose themselves, but past experience did not moderate the effect of fluency on participation. Of those who reported their purchase history ($N = 390$), 54% had previously purchased heartburn medication, and 46% had not. Participants were more likely to choose themselves in the fluent condition than in the disfluent condition (Wald's $\chi^2 = 6.82, p = .009$, odds ratio = .58), and when they had past experience with purchasing heartburn medication than when they did not (Wald's $\chi^2 = 12.00, p = .001$, odds ratio = .48). The interaction between fluency and past experience was not significant (Wald's $\chi^2 = .26, p = .61$, odds ratio = 1.24), indicating that the effect of fluency did not depend on experience.

Discussion

This study provides initial evidence that communicating treatment options more fluently can make consumers more likely to participate in medical decisions. Participants were more likely to choose a medication themselves than delegate to a pharmacist when the options were presented in a simple table format than in a dense paragraph format, regardless of their prior experience with choosing a heartburn medication, and even though scores on an objective comprehension check in a pretest were equally good in the fluent and disfluent conditions. To further isolate whether mere fluency can increase participation, we conducted a preregistered follow-up experiment in which we presented the same information in different fonts to create fluent and disfluent conditions. Participants considered a decision about whether to get surgery (from study 3), presented in either a fluent or disfluent font and chose whether to decide themselves or delegate the decision to a doctor. As predicted, all else being equal, merely presenting the same description of participants' treatment options in a fluent versus disfluent font was enough to make them more likely to choose for themselves (fluent = 81.3%, disfluent = 75.2%; $\chi^2(1, N = 738) = 4.07, p = .044, \phi = .07$; see apps. B and C for full materials and analyses).

Fluency increased participation most among people with inadequate health literacy, who are most challenged by processing health information. Note, however, that only 10% of our participants demonstrated inadequate health literacy, suggesting that future research is needed to understand the full potential of fluency interventions to increase participation among low literacy populations. Although fluency had

a similar effect on participation among participants with and without prior experience with choosing a heartburn medication, it is possible that prior experience may matter differently depending on the level of that experience: individuals with more general experience may respond differently to fluency versus those who have chosen from a certain set of medications before or who regularly choose a particular heartburn medication. Our next study aims to replicate these findings and test whether situational characteristics like time pressure moderate the effect of fluency on participation.

STUDY 2: THE EFFECT OF FLUENCY ON PARTICIPATION UNDER TIME PRESSURE

Healthcare decisions, especially those about medical treatment, are often made under time pressure. Although patients typically spend an hour and a half at an appointment, the average face-time with a doctor is about 20 minutes (Ray et al. 2015), and most topics get about 1 minute of discussion time (Tai-Seale, McGuire, and Zhang 2007). Past research suggests that time pressure may intensify fluency's effects. Time pressure can lead consumers to seek ways to simplify choices (Ariely and Zakay 2001), which can make them more likely to choose a preferred option rather than defer or opt out of a decision entirely (Dhar and Nowlis 1999), suggesting that people might be more likely to choose themselves when under time pressure. However, time pressure may have no effect or even a negative effect on consumers' likelihood of choosing an option themselves when choices are exceedingly complex and unstructured (i.e., if they are presented disfluently; e.g., Greenleaf and Lehmann 1995). This study employed a 2 (fluent vs. disfluent format) by 2 (time pressure vs. no time pressure) between-subjects design to explore whether time pressure moderates the effect of fluency on participation. The study was preregistered at <https://aspredicted.org/mk9kn.pdf>.

Method

Participants. Eight hundred and nine adults (404 male, 400 female, 5 unspecified; $M_{\text{age}} = 40.34$; 601 White, 60 Black, 91 Asian, 35 Hispanic, 17 other ethnicity/race, 5 unspecified) were recruited via MTurk and paid \$0.60 to participate. Nine participants failed the comprehension check. As intended, objective comprehension did not differ across conditions: participants were equally likely to answer the comprehension check correctly in the fluent (99.3%) and disfluent conditions (98.5%; $\chi^2(1, N = 809) = .99, p = .32, \phi = .04$). As preregistered, participants who failed the comprehension check were excluded from analysis, resulting in a final sample of

800 participants. The results are the same with these observations included.

Procedure. Participants received the same scenario as in study 1 with a few modifications (see app. D). To manipulate time pressure, some participants were informed on the page preceding the focal treatment decision that the pharmacy was about to close, and so they would need to make a decision quickly. Then, on the same page as the focal treatment decision, these participants saw a timer counting down one minute. As a manipulation check, at the end of the survey, all participants indicated the extent to which they felt pressured to make a decision quickly on a scale ranging from 1 = not at all to 7 = very much. Additionally, all participants completed an objective comprehension check (i.e., "In this scenario, what treatment was being considered?"). Finally, all participants indicated whether they had purchased heartburn medication before as a measure of prior experience, as well as their gender, age, and ethnicity/race.

Results

As intended, participants in the time pressure condition reported feeling significantly more pressure to make a decision quickly ($M = 5.42, SD = 1.66$) than those in the no time pressure condition ($M = 3.08, SD = 1.85; t(784.64) = 18.80, p < .001$, equal variances not assumed).

As predicted and as in study 1, participants were more likely to choose a medication themselves than delegate the decision to the pharmacist when information was presented in a fluent table format (48%) than in a disfluent paragraph format (30%; Wald's $\chi^2 = 26.94, p < .001$, odds ratio = .46). Time pressure alone did not influence the percentage of participants who opted to choose a medication themselves (40% with time pressure vs. 37% without time pressure; Wald's $\chi^2 = .91, p = .34$, odds ratio = .87). Importantly, time pressure interacted with fluency (Wald's $\chi^2 = 5.67, p = .02$, odds ratio = .49) such that fluency had a greater effect when there was time pressure (54% in the fluent condition vs. 27% in the disfluent condition; $\chi^2(1, N = 404) = 28.89, p < .001, \phi = .27$) than when there was not (42% in the fluent condition vs. 32% in the disfluent condition; $\chi^2(1, N = 396) = 3.91, p = .048, \phi = .10$).¹

1. The preregistered analysis plan specified that we would use an ANOVA to assess the effect of fluency on participation. However, we report the results of a logistic regression as that is more appropriate for use with a binary dependent measure. The results are the same when analyzed using an ANOVA.

As in study 1, people with past experience purchasing heartburn medication were more likely to participate. Of the 799 participants who reported their prior experience, 62% had previously purchased heartburn medication, and 38% had not. Participants were more likely to choose themselves when they had past experience with purchasing heartburn medication than when they did not (Wald's $\chi^2 = 20.02$, $p < .001$, odds ratio = 2.03). Past experience did not interact with fluency (Wald's $\chi^2 = .22$, $p = .64$, odds ratio = 1.16), time pressure (Wald's $\chi^2 = .27$, $p = .60$, odds ratio = .85), or fluency and time pressure (Wald's $\chi^2 = .10$, $p = .75$, odds ratio = .82).

Discussion

Communicating treatment options more fluently makes consumers more likely to participate in medical decisions, both when decisions are subject to time pressure and when they are not. Moreover, time pressure moderates the effect of fluency on participation: fluency has a greater effect on participation under time pressure than under no time pressure. Although isolating the process by which time pressure moderates the relationship between fluency and participation was beyond the scope of this study, exploratory analyses suggest that time pressure influences decision strategy rather than decision time (see app. E). Our findings also show that prior experience with choosing heartburn medication increased the likelihood that participants would choose a medication themselves, but did not moderate the effect of fluency or time pressure on participation. We next examine what underlies fluency's effect on participation.

STUDY 3: THE ROLE OF SUBJECTIVE COMPREHENSION

Even when a consumer objectively comprehends a decision, presenting choices more fluently may increase the consumer's subjective sense of comprehension, making them more willing to make their own decision. In this study, we examine the role of subjective comprehension in the relationship between fluency and participation. We predicted that fluency would increase participation by making participants feel like they better understand the choice and feel more confident in their ability to choose. This study was preregistered at <https://aspredicted.org/7vn7x.pdf>.

Method

Participants. Six hundred twelve adults (310 male, 286 female, 9 nonbinary, 7 unspecified; $M_{\text{age}} = 38.72$; 425 White, 40 Black, 96 Asian, 32 Hispanic, 12 other ethnicity/race,

7 unspecified) were recruited via Prolific and paid \$0.60 to participate. Three observations were excluded for having a Prolific ID that duplicated a previous participant's. Four participants did not complete the objective comprehension questions, and 56 answered at least one question incorrectly. Although unintended, participants were slightly more likely to answer all questions correctly in the fluent condition (94.1%) than in the disfluent condition (87.4%; $\chi^2(1, N = 605) = 8.09$, $p = .004$, $\phi = .12$). As preregistered, participants who did not answer all questions correctly were excluded from the analyses, resulting in a final sample of 549 participants. The results are the same with these observations included.

Procedure. Participants encountered a choice of whether to have surgery for a neck injury, described in either plain language (*fluent* condition) or medical jargon (*disfluent* condition) (Steffel and Williams 2018; see app. F for full materials). First, participants indicated whether they preferred to make the decision themselves and which treatment option they preferred, or whether they wanted to have the doctor decide for them. Second, participants answered six subjective comprehension questions ($\alpha = .95$; "How well do you feel that you understand: these treatment options . . . the possible consequences of choosing each of these treatment options . . . which treatment option is best for you?" and "How confident do you feel about your ability: to make this choice . . . to use your understanding of these treatment options in making this choice?; and . . . to choose the treatment that is best for you?"; adapted from Moorman et al. 2004) on a scale ranging from 1 = not at all to 7 = extremely. Third, they completed three objective comprehension questions ("In this scenario, what part of your body had been injured?"; "What would happen if you chose to get the surgery?"; and "What would happen if you chose NOT to get the surgery?"). Fourth, as a manipulation check, participants saw both the plain language and medical jargon versions of the scenario and rated how easy or difficult each was to read on a scale from 1 = very easy to 7 = very difficult. Fifth, participants indicated their gender, age, and ethnicity/race.

Results

As intended, participants thought the scenario was less difficult to read in plain language ($M = 2.28$, $SD = 1.55$) than in medical jargon ($M = 4.89$, $SD = 1.63$; $t(547) = 27.93$, $p < .001$, $d = 1.85$).

Participants who encountered the plain language scenario were more likely to select a treatment themselves (73.8%)

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than those who encountered the medical jargon version (63.9%; $\chi^2(1, N = 549) = 6.28, p = .01, \phi = .11$). Participants in the fluent condition also had a greater sense of subjective comprehension ($M = 5.11, SD = 1.33$) than those in the disfluent condition ($M = 4.43, SD = 1.51; t(522.84) = 5.56, p < .001, d = .48$, equal variances not assumed).

Notably, subjective comprehension mediated the relationship between fluency (1 = fluent, 0 = disfluent) and participation (1 = chose treatment, 0 = delegated to doctor), according to a bootstrapped mediation analysis using the PROCESS macro (model 4, Hayes 2017). When participation was simultaneously regressed onto subjective comprehension and fluency, subjective comprehension predicted participation ($\beta = .96, Z = 10.30, p < .001$) and the main effect of fluency on participation was reduced to non-significance ($\beta = .13, Z = .59, p = .55$). The indirect effect of subjective comprehension was robust (95% CI = .41 to .93). See figure 1.

We also ran exploratory analyses to examine the contributing roles of objective and subjective comprehension in explaining the relationship between fluency and participation. We created a measure of objective comprehension by adding up the number of objective comprehension questions participants answered correctly (between 0 and 3). We tested for serial mediation using the PROCESS macro (model 6, Hayes 2017) and observed an indirect effect of fluency on participation through objective comprehension (95% CI = .003 to .13) and through subjective comprehension (95% CI = .38 to .85) but not serially through objective and then subjective comprehension (95% CI = $-.005$ to .03). We performed contrasts to compare these indirect paths and observed that the path through subjective comprehension was stronger than the path through objective comprehension (95% CI = .32 to .81) and the serial path (95% CI = .37 to .84). The path through objective comprehension did not differ from the serial path (95% CI = $-.005$ to .11).

Discussion

Communicating health-related decisions more simply increases participation by boosting consumers' subjective sense of comprehension. Fluency increased participation even though we only included participants who answered all objective comprehension questions correctly in our analyses, which suggests that the influence of fluency on delegation is unlikely to be solely attributable to objective comprehension (although improving people's understanding of their options may certainly contribute to making fluency effective at increasing participation). Indeed, even when we included those who did not answer all our objective comprehension questions correctly and explored the effects of objective and subjective comprehension simultaneously, we found an effect of fluency on participation through subjective comprehension independent of its effect through objective comprehension. Together, our findings suggest that presenting information in an easy-to-process manner is important not just because it can help people to better understand their options, but because it empowers people to feel like they better understand the decision at hand and are better able to choose the option that is best for them.

GENERAL DISCUSSION

Despite the value of enabling consumers to participate in decisions about their health, current practices fall short of promoting the level of empowerment that consumers desire and deserve. Our findings suggest a solution: communicating choices more simply can make consumers more likely to engage in health decisions. The impact of fluency on participation was strongest among people with inadequate health literacy and under time pressure and persisted regardless of how much experience people had with a health condition. The relationship between fluency and participation was driven by subjective comprehension, independent of objective comprehension (see also apps. G and H, study S2, for

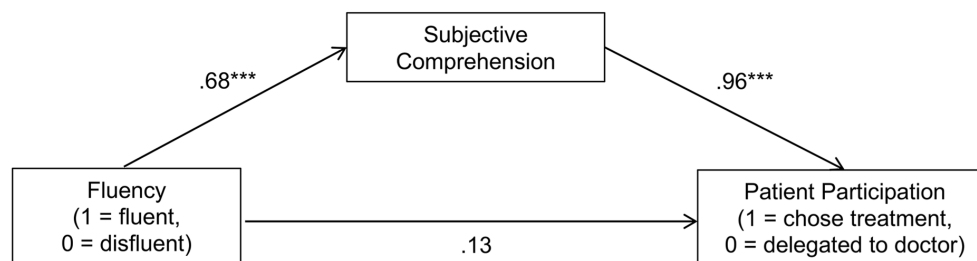


Figure 1. Mediation model (study 3). Index of mediation: 95% CI = .41, .93. * $p < .05$, ** $p < .01$, *** $p < .001$.

evidence that these effects are also independent of consumers' trust or confidence in their doctors). These findings underscore the importance of making medical information easy to process so consumers feel empowered to advocate for their own best interests.

Limitations and Future Directions

Although research in medical decision making has made great strides in identifying antecedents of patient participation (e.g., Guadagnoli and Ward 1998; Say, Murtagh, and Thomson 2006; Stacey et al. 2014; Couët et al. 2015), most studies of patient participation have consisted of a single cross-sectional study so that causation cannot be reliably inferred and have focused primarily on patients' stable traits that predict participation, meaning that situational and contextual factors that can influence participation are less well understood. By using carefully controlled scenarios here, we isolate fluency as a determinant of participation—something that is rarely achievable in real-world medical contexts. Our simplified experimental manipulations do sacrifice some realism in the service of testing the effects of fluency as cleanly as possible. However, we designed our materials to resemble how medical choices are sometimes presented in medical settings; consider the lengthy lists of ingredients and potential side effects typical of pharmaceutical labels or the jargon-filled descriptions in many health materials. Indeed, most health-related materials exceed the reading level of the average high school graduate (Rudd, Moeykens, and Colton 1999) and are beyond the average patient's reading level (Greene and Peters 2009). Our findings suggest that these features are not merely innocuous aesthetic details but could deter people from participating in the very choices they are intended to support.

Another limitation of relying on scenarios is that it leaves open the question of the extent to which these findings generalize to real decisions. Studies 1 and 2 suggest that our findings are likely to generalize, at least in some situations, by showing that fluency increased participation regardless of whether participants had past experience with the decision. This is consistent with past research showing that the factors that prompt people to delegate decisions are often the same for real versus hypothetical decisions as well as for those involving high versus low stakes (Steffel and Williams 2018). Nonetheless, it is possible that the real physical pain, psychological trauma, and high stakes associated with many medical decisions could overwhelm or enhance the effect of fluency, and future research should explore what happens when such factors are at play. Also notable is that our participants may have been relatively health literate

compared to the general population: only 10% of participants in study 1 had inadequate health literacy, versus 36% of the population in the United States (Kutner et al. 2006). Our finding that disfluency led to greater nonparticipation among people with inadequate health literacy, albeit based on a small number of individuals, is suggestive that our studies may understate the value of fluency for increasing participation and highlights the need for future research with low literacy populations.

Although we operationalized participation as choosing oneself or delegating, there are types and degrees of patient engagement. Prior experience with a health decision may mean that people pay less attention to new information in the first place, and hence it (and its fluency) plays less of a role in participation. Consumers might ask follow-up questions or seek advice before making a choice, for example, and fluency might affect such behaviors differently from how it affects delegation. Furthermore, this research focused on participation in the treatment decision itself, but fluency may also have downstream effects on other aspects of patient engagement such as adherence or preventative care (Charles, Gafni, and Whelan 1999). Finally, this research examined delegation to health professionals (i.e., pharmacists and doctors), but future research might also consider the role of fluency in the decision to delegate to family and other caregivers.

Finally, although every patient deserves the opportunity to participate in decisions regarding their health, not all patients should be or want to be nudged to make medical decisions on their own. If subjective comprehension is not accompanied by objective comprehension, encouraging patient autonomy could lead to overconfidence and eventually flawed health decisions (Dunning et al. 2004; Sanchez and Dunning 2018). Moreover, fluently presented misinformation could enhance subjective comprehension and create unwarranted self-confidence, impacting patients, providers, and payers alike. Choosing can sometimes take a toll on people's emotional well-being, especially when choices have potentially tragic outcomes (Botti, Orfali, and Iyengar 2009). At times, patients may prefer not to be in charge, for example, when they wish to avoid responsibility for a particularly fraught medical decision (Barasz and Hagerty 2021), and they may resent health professionals who do not provide a clear recommendation (Kassirer, Levine, and Gaertig 2020).

Theoretical and Practical Implications

This research advances our understanding of how consumers decide whether to exercise their right to choose the

treatment they feel is best for them, how consumers are influenced by the way in which medical decisions are communicated by institutions and institutional agents, and how consumers can be empowered to advocate for their preferences in decisions regarding their health. Whereas past research on fluency in health communications has focused on outcomes related to objective comprehension, it has been largely silent on patient participation (for a review, see McCaffery et al. 2013). The present research contributes to the medical literature by showing that communicating medical decisions more simply can increase patient participation, independent of objective comprehension. More broadly, this research contributes to the consumer literature by deepening the current understanding of when consumers prefer to choose themselves versus let someone else choose for them.

Fluency offers a practical solution for engaging consumers in medical decisions: making health-related information easier to process can empower consumers to have a voice in managing their health, a vital component of patient-driven healthcare (Katz 1984/2002). Healthcare professionals can promote participation by communicating medical choices in plain language, simplifying health materials, and developing decision aids. Policy makers can foster patient empowerment by developing fluency standards for health communications, incentivizing the implementation of these standards, and teaching healthcare providers to apply these standards more effectively. Doing so may give consumers the confidence they need to advocate for their preferences and take that first, active step toward living happier, healthier lives.

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