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Beliefs about Staying Home: Findings from a Nationally Representative Probability Sample of U.S. Adults in the Early Days of the COVID-19 Epidemic

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Abstract

Understanding the beliefs about staying home is essential to inform stay-at-home policies to mitigate COVID-19 and future epidemics. This study (1) identified the salient advantages, disadvantages, and facilitating beliefs about staying home, and (2) examined the relationship between these beliefs and intention. U.S. adults from a nationally representative probability-based household panel completed an online reasoned action approach belief elicitation from April 10-20, 2020, about one month after stay-at-home guidelines were implemented. First, we conducted an inductive content analysis to reveal salient beliefs about staying home. We identified eight advantages, 12 disadvantages, and 12 facilitators that broadly spanned across health domains: individual, population, interpersonal, occupational, financial, and leisure health. Then, we conducted three regression analyses, one for each of the three sets of beliefs, predicting intention to stay home for the next month from worker status and belief mentioned. In these regression analyses, four advantages, four disadvantages, and four facilitators made independent contributions to explaining intention. The breadth of the elicited beliefs suggests that COVID-19 is perceived to have impacted many dimensions of our lives, and that interventions need to be just as broad. Communication and educational interventions could help people understand the benefits of staying home to themselves, to their families, and to the wider community. Programs that keep essential supplies available could help people stay home. Structural interventions with financial safety nets and policies that help people stay employed during an epidemic might address people's concerns about the impact of staying home on their financial and occupational health.

Keywords

Reasoned Action Approach, belief elicitation, stay home, stay-at-home orders, COVID-19, nationally representative sample

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Abstract

Understanding the beliefs about staying home is essential to inform stay-at-home policies to mitigate COVID-19 and future epidemics. This study (1) identified the salient advantages, disadvantages, and facilitating beliefs about staying home, and (2) examined the relationship between these beliefs and intention. U.S. adults from a nationally representative probability-based household panel completed an online reasoned action approach belief elicitation from April 10-20, 2020, about one month after stay-at-home guidelines were implemented. First, we conducted an inductive content analysis to reveal salient beliefs about staying home. We identified eight advantages, 12 disadvantages, and 12 facilitators that broadly spanned across health domains: individual, population, interpersonal, occupational, financial, and leisure health. Then, we conducted three regression analyses, one for each of the three sets of beliefs, predicting intention to stay home for the next month from worker status and belief mentioned. In these regression analyses, four advantages, four disadvantages, and four facilitators made independent contributions to explaining intention. The breadth of the elicited beliefs suggests that COVID-19 is perceived to have impacted many dimensions of our lives, and that interventions need to be just as broad. Communication and educational interventions could help people understand the benefits of staying home to themselves, to their families, and to the wider community. Programs that keep essential supplies available could help people stay home. Structural interventions with financial safety nets and policies that help people stay employed during an epidemic might address people's concerns about the impact of staying home on their financial and occupational health.

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Introduction

Stay-at-home orders effectively prevent 2019 coronavirus disease (COVID-19) transmission (Pei et al., 2020). They are likely to be mandated to control future novel infectious diseases. Because the effectiveness of such policies depends on a large proportion of the population adopting this behavior, public health professionals would benefit from identifying beliefs and other determinants of complying with stay-at-

home orders. The COVID-19 pandemic has highlighted the critical importance of theory-based research because theory-based research uses established constructs and measures to understand behaviors, and theory-informed interventions are more effective at changing behaviors (Allegrante et al., 2020; Glanz & Bishop, 2010).

The reasoned action approach (RAA) (Fishbein & Ajzen, 2010) and its predecessor, the theory of planned behavior (TPB) (Ajzen, 1991), are health behavior

theories that have been successfully applied to understand how people make decisions (Armitage & Conner, 2001; McEachan et al., 2011; McEachan et al., 2016). A review demonstrated that interventions based on RAA/TPB effectively change behavior (Steinmetz et al., 2016). According to the RAA, intention is a key predictor of behavior. In turn, three global constructs (attitude toward the behavior, perceived norm, and perceived behavioral control) are determinants of intention. Even more deeply, belief structures determine the three global constructs. *Behavioral beliefs about the salient consequences (advantages and disadvantages)* underly attitude; *normative beliefs about what salient referents (approvers and disapprovers)* think underly perceived norm; and *control beliefs about salient circumstances (facilitators and barriers)* underly perceived behavioral control.

Large-scale research has examined how well global constructs from the RAA/TPB predict intention (Bigot et al., 2021; Frounfelker et al., 2021; Lin et al., 2020; Norman et al., 2020; Sturman et al., 2020; Tabibi et al., 2021). In a prior study, we examined which RAA global constructs were associated with the intention to stay home among U.S. adults (Owens et al., in press). These studies, and our own, demonstrate that the RAA/TPB global constructs successfully predict intention across countries, sampling methods, and phrasings of the behavior.

Given that research has demonstrated that intention is associated with the three global RAA/TPB constructs, an important question remains: what are the salient beliefs underlying these constructs? An RAA belief elicitation is a descriptive study that identifies the top-of-the-mind beliefs that might operate as determinants, and identifying underlying beliefs can help

develop interventions (Middlestadt et al., 1996). We located only one elicitation in the published literature. Owens et al. (2021) elicited beliefs about “social distancing, which is you staying inside your residence except for essential needs and maintaining 6 feet from people when out from now until April 30” from 106 U.S. adults from MTurk. However, MTurk samples are not representative of the U.S. population (Walters et al., 2018).

For this study, we added three RAA elicitation questions to an existing survey that was ready to be fielded with a probability sample of the U.S. adult population a month after the stay-at-home orders began. The behavior we selected was to “stay home for the next month which means to stay in your house or apartment except to get food, care for a relative or friend, get necessary health care, go to an essential job, or exercise separated from others” (Lee et al., 2020, August 11). Our *first aim* was to identify the underlying salient beliefs. Because we could only add three questions to the existing survey, we prioritized *advantages* and *disadvantages* (underlying attitudes) and *facilitators* (underlying perceived behavioral control). We decided that eliciting salient barriers was less important because previous research has revealed considerable overlap between items elicited for facilitators and barriers (Middlestadt, 2012). We decided salient referents were less important because family members and friends are common referents across elicitations (Downs & Hausenblas, 2005). Our *second aim* was to identify the relationship between salient beliefs and intention. Because we found worker status as an important predictor of intention in our previous study (Owens et al., in press), we controlled for worker status when examining beliefs’ association with intention.

Methods

Participants

Data were collected online from April 10-20, 2020 from members of the Ipsos KnowledgePanel, a nationally representative, probability-based household panel established using address-based sampling via the U.S. Postal Service's Delivery Sequence File (Ipsos, 2020a, 2020b). Members without Internet connection were provided with free Internet services and web-enabling devices. Panel members were invited to participate in this survey using an equal probability selection method, and selected members were emailed the online survey link. Ipsos maintains an incentive program for those who complete their surveys. Details on the panel and the methodology are available (Ipsos, 2020a, 2020b). Surveys using this panel—including those of the CDC—have been shown to generate high-quality, credible, and generalizable results for academic research (Hall et al., 2017; Nguyen et al., 2021). The Indiana University Human Subjects Office (#2004194314) approved the study protocol. Of the 1632 KnowledgePanel members invited to participate, 1010 (61.9%) completed the survey. After removing missing data and weighing the data, the final sample size was 951.

Measures

Demographic characteristics. Participants reported their sex, marital status, race/ethnicity, age, region, metropolitan statistical area residence, highest level of education, income, and employment status.

Worker status. Participants were asked if they were designated as: 1) *essential worker—healthcare worker, pharmacy employee, first responder, hospital or doctor's office employee*; 2) *essential worker—mass transit or airport worker, gas*

station or utilities, national security or military; 3) *essential worker—work in grocery store, restaurant, food production or farm/agriculture, post office, mail or package delivery*; 4) *essential worker—other kind not listed above*; 5) *I am employed but not considered an essential worker*; 6) *N/A, I am not employed*. These responses were collapsed to create a three-level worker status variable: essential worker (responses 1-4), nonessential worker (response 5), and not employed (response 6).

Intention. Participants were asked if they “plan to stay home for the next month” with a 5-point agreement scale (1 = *strongly disagree*, 5 = *strongly agree*).

Selected RAA beliefs. To identify salient *advantages* underlying the attitude, participants were asked to “Name one *good thing* that might happen if you stay home for the next month.” To identify salient *disadvantages* underlying the attitude, participants were asked to “Name one *bad thing* that might happen if you stay home for the next month.” To identify salient *facilitators* underlying perceived behavioral control, participants were asked to “Name one thing that might make it *easier* for you to stay home for the next month.”

Analyses

A general population weight was applied to produce nationally representative results. Ipsos (2020a, 2020b) calculated and provided a study-specific final weight designed to adjust for differential nonresponse considering gender, age, race/ethnicity, education, census region, and household income from the Current Population Survey's March supplement data. Analyses were conducted using SPSS (IBM Corp, 2016).

Qualitative analyses. We conducted an inductive content analysis to identify salient beliefs about staying home (Hsieh & Shannon, 2005). First, we exported responses

to the three open-ended questions into an Excel file. Second, we translated Spanish responses into English. Third, we created a codebook and coded with specific codes, or responses with similar wording. Fourth, we assessed interrater reliability with a random 15% of responses per question (or 152 responses per question). The kappa statistic revealed strong agreement: advantages $\alpha = 0.982$; disadvantages $\alpha = 0.994$; and facilitators $\alpha = 1.000$ (McHugh, 2012). Fifth, we combined specific codes to create salient beliefs. For example, four specific codes (“I might not get COVID,” “I might not get sick,” “I might stay healthy,” and “I might not die/stay alive”) were combined to create the salient belief of “might keep me healthy.” Combining the specific codes resulted in eight advantages, 12 disadvantages, and 12 facilitators. Participants were coded 1 or *yes*, for *mentioning the belief* and 0 or *no*, for *not mentioning the belief*.

Quantitative analyses. To provide a preliminary indication of which beliefs were related to intention, we conducted three regression analyses, one for each set of beliefs. For all three, intention to stay home for the next month was the outcome variable. Whether the participant mentioned each belief and worker status were the predictor variables. Worker status was recoded into two planned comparisons. One comparison (Contrast 1) compared essential workers to the other two groups (i.e., nonessential workers and those not employed). The second comparison (Contrast 2) compared nonessential workers to those not employed.

Results

Participant Characteristics

As shown in Table 1, in the weighted data, 52.05% of the participants were female and 47.95% were male. More than half of the participants were married (56.42%). About

two-thirds of the participants identified as non-Hispanic white (63.47%). Approximately two-fifths of the participants were 55 years or older (41.43%). About one-third of participants lived in the South (37.75%), and 88.12% lived in a metropolitan statistical area. Approximately one-third (33.89%) reported a bachelor’s degree or higher as their highest educational level, and 50.53% reported an annual household income that was \$75,000 or more. About half of the participants were working as paid employees (55.84%), while 21.66% were retired.

About one-third (34.07%) identified themselves as essential workers, 24.71% as nonessential workers, and 41.22% as not employed. Of those who identified as essential workers, 27.69% worked as health workers or first responders, 9.23% were military, airport, or transit workers, 15.38% were grocery, post office, or delivery workers, and 47.69% worked in an essential field that was not listed.

Intention to Stay Home

The mean for intention to stay home was 3.96. One-third of participants strongly agreed (32.91%), 46.58% agreed, 9.36% noted neither, 6.52% disagreed, and 4.84% strongly disagreed they plan to stay home.

Regression Analyses Predicting Intention

Tables 2, 3, and 4 present the regression analyses predicting intention from worker status and the three sets of beliefs about staying home. Each table presents means, simple correlations with intention, standardized weights (B) representing the independent contribution of the variable, *t*-values, and significance levels. All three analyses resulted in small but statistically significant multiple *R*s. In all three analyses, the contrast comparing essential workers to

Table 1

Sociodemographic Characteristics of Participants (N = 951)

	N	%
Gender		
Male	456	47.95
Female	495	52.05
Marital Status		
Married	536	56.42
Widowed	37	3.89
Divorced	96	10.11
Separated	20	2.11
Never married	207	21.79
Living with partner	54	5.68
Race/Ethnicity		
White, Non-Hispanic	603	63.47
Black, Non-Hispanic	112	11.79
Other, Non-Hispanic	55	5.79
Hispanic	151	15.89
2+ Races, Non-Hispanic	29	3.06
Age		
18-24 years old	84	8.83
25-34 years old	180	18.93
35-44 years old	163	17.14
45-54 years old	130	13.67
55-64 years old	183	19.24
65 years old and older	211	22.19
Region		
Northeast	167	17.56
Midwest	198	20.82
South	359	37.75
West	227	23.87
MSA Status		
Non-metro area	113	11.88
Metro Area	838	88.12
Highest Level of Education		
Less than high school	91	9.58
High school	273	28.74
Some college	264	27.79
Bachelor's degree or higher	322	33.89
Income		
\$24,999 or less	129	13.58
\$25,000 to \$49,999	175	18.42
\$50,000-\$74,999	166	17.47
\$75,000 or more	480	50.53

Table 1 (continued)

Sociodemographic Characteristics of Participants (N = 951)

	N	%
Employment Status		
Working - as a paid employee	531	55.84
Working - self-employed	75	7.89
Not working - on temporary layoff job	7	0.74
Not working - looking for work	45	4.73
Not working - retired	206	21.66
Not working - disabled	34	3.58
Not working - other	53	5.57
Worker Status		
Essential worker	324	34.07
Nonessential worker	235	24.71
Not employed	392	41.22

the other two groups (nonessential workers and those not employed) was statistically significant. The weight was negative, indicating that essential workers had lower intentions to stay home than the other two groups on worker status. The second contrast that compared nonessential workers to those who were not employed did not make an independent contribution in any of the three analyses.

Perceived advantages of staying home. Table 2 presents the regression results predicting intention to stay home for the next month from worker status and the eight perceived advantages of staying home. The analysis resulted in a statistically significant adjusted multiple $R^2 = .096$, $F(10, 950) = 11.041$, $p < .001$.

The elicited advantages spanned across wellness domains: individual, population, leisure, interpersonal, and financial benefits. The most frequently mentioned advantage (38.95%) was the belief that staying home for the next month “might keep me healthy.” Less frequently, participants mentioned that staying home “might keep my family

healthy” (4.67%) or “might keep others healthy” (4.16%). Participants also mentioned (17.68%) a population health benefit, “might slow or stop the spread of COVID.”

Participants perceived benefits beyond health advantages. “Might allow me to catch up on things” was the second most frequently mentioned belief (18.17%). This belief included catching up on home-based activities such as chores/house projects, rest/sleep, and reading. Some participants indicated that staying home might help them “spend time with family” (7.46%) and “save or spend less money” (6.94%).

Four of the salient advantages had statistically significant standardized weights and made independent contributions to explaining intention. All four of these weights were positive, indicating that those who mentioned the advantages had higher intentions to stay home than those who did not mention the advantage.

Perceived disadvantages of staying home. Table 3 presents the regression results predicting intention to stay home for the next

Table 2

Regression Analysis Predicting Intention to Stay Home from Beliefs about Perceived Advantages (n = 951)

	Mean	<i>r</i> with Intention	<i>b</i>	Std Error	<i>B</i>	<i>t</i>
Constant			3.603	.074		48.622***
Worker Status						
Contrast 1 (Essential v Other two)	.0073	-.242***	-.513	.070	-.230	-7.350***
Contrast 2 (Nonessential v Not employed)	-.0823	-.060	-.136	.084	-.051	-1.626
Advantages: My staying home for the next month						
Individual health benefits						
Might keep me healthy	.3895	.126***	.424	.083	.196	5.113***
Might keep my family healthy	.0467	-.006	-.022	.156	-.004	-0.139
Might keep others healthy	.0416	.061	.417	.166	.079	2.507**
Population health benefits						
Might help hospitals/health care workers/system	.0145	.081*	.532	.279	.060	1.907
Might slow or stop the spread of COVID	.1768	.101**	.500	.100	.181	4.990***
Leisure and recreational benefits						
Might allow me to catch up on things	.1817	-.036	.237	.101	.087	2.343*
Interpersonal benefits						
Might allow me to spend time with my family	.0746	-.028	.230	.134	.057	1.714
Financial benefits						
Might help me save/spend less money	.0694	-.039	.195	.140	.047	1.396

$R = .324^{***}$, Adjusted $R^2 = .096$, $F(10, 950) = 11.041$

* $p < .05$, ** $p < .01$, *** $p < .001$

Note. A mean of .3895 indicates that 38.95% of participants mentioned a salient belief that staying home “might keep me healthy.”

Table 3

Regression Analysis Predicting Intention to Stay Home from Beliefs about Perceived Disadvantages (n = 951)

	Mean	<i>r</i> with Intention	<i>b</i>	Std Error	<i>B</i>	<i>t</i>
Constant			3.989	.064		62.048***
Worker Status						
Contrast 1 (Essential v Other two)	.0073	-.242***	-.441	.073	-.198	-6.041***
Contrast 2 (Nonessential v Not employed)	-.0823	-.060	-.032	.085	-.012	-0.381
Disadvantages: My staying home for the next month....						
Minor emotional health disadvantages						
Might make me bored or stir crazy	.2095	-.017	-.067	.092	-.026	-0.726
Mental/emotional health disadvantages						
Might lead to depression, anxiety, or other mental health problems	.0908	.024	.018	.121	.005	0.146
Physical health disadvantages						
Might mean gaining weight, exercising less, or eating more	.1073	.087**	.177	.116	.052	1.526
COVID disadvantages						
Might not keep me from getting COVID	.0511	.014	-.017	.157	-.004	-0.109
Might not reduce COVID or keep my family from getting	.0223	.014	.113	.228	.016	0.498
Interpersonal disadvantages						
Might miss interacting with family and friends	.0824	.089**	.257	.126	.067	2.042*
Miss getting out of the house to attend social events	.0547	.049	.081	.149	.017	0.541
Financial disadvantages						
Might lead to personal financial difficulties	.1052	-.096**	-.203	.120	-.059	-1.693
Might weaken the economy	.0232	-.084**	-.546	.224	-.078	-2.444*
Might make me run out of or be low on supplies	.0335	.030	.114	.186	.019	0.614
Occupational disadvantages						
Might mean I lose my job	.0316	-.139***	-.662	.198	-.110	-3.346***
Might mean I will not be able to work	.0185	-.066*	-.507	.249	-.065	-2.031*

$R = .305^{***}$, Adjusted $R^2 = .080$, $F(14, 950) = 6.872$

* $p < .05$, ** $p < .01$, *** $p < .001$

Note. A mean of .2095 indicates that 20.95% of participants mentioned a salient belief that staying home “might make me bored or stir crazy.”

Table 4

Regression Analysis Predicting Intention to Stay Home from Beliefs about Perceived Facilitators (n = 951)

	Mean	<i>r</i> with Intention	<i>b</i>	Std Error	<i>B</i>	<i>t</i>
Constant			3.862	.057		67.245***
Worker Status						
Contrast 1 (Essential v Other two)	.0073	-.242***	-.465	.071	-.209	-6.538***
Contrast 2 (Nonessential v Not employed)	-.0823	-.060	-.037	.086	-.014	-.428
Facilitators: ...might make it easier for me to stay home						
Financial facilitators						
Having money	.1041	-.163***	-.352	.115	-.102	-3.061**
Getting financial assistance	.0610	-.003	.140	.144	.032	.969
Occupational facilitators						
Being able to work from home	.0687	-.057	-.007	.136	-.002	-.051
Not having to work	.0145	-.020	-.089	.277	-.010	-.321
Leisure or recreational facilitators						
Having things to do at home	.1755	.076*	.203	.094	.073	2.156*
Interpersonal facilitators						
Living and spending time with others	.0616	.031	.158	.141	.036	1.117
Virtually chatting with others	.0209	.029	.253	.232	.034	1.087
Supply chain facilitators						
Having food and supplies delivered	.0725	.126***	.495	.132	.122	3.757***
Having supplies and access to buy supplies	.0726	.049	.262	.132	.064	1.981*
Having access to technology	.0274	.017	.123	.203	.019	.607
Natural environment facilitators						
Having the right weather	.0386	.053	.262	.173	.048	1.513
Organizational political facilitators						
Having supportive government and store policies	.0374	.039	.307	.177	.055	1.734

$R = .316^{***}$, Adjusted $R^2 = .086$, $F(14, 950) = 7.398$

* $p < .05$, ** $p < .01$, *** $p < .001$

Note. A mean of .1041 indicates that 10.41% of participants mentioned a salient belief that a facilitator of staying home might be “having money.”

month from worker status and the 12 perceived disadvantages of staying home. The regression resulted in a small but statistically significant adjusted $R^2 = .080$, $F(14, 950) = 6.872$, $p < .001$. Once again, perceived disadvantages spanned across wellness domains.

The most common disadvantage (20.95%) was that staying home “might make me bored or stir crazy.” Another 9.08% mentioned that staying home “might lead to depression, anxiety, or other mental health problems.” One-tenth (10.73%) of participants mentioned that staying home “might lead to gaining weight, exercising less, or eating more” or “might lead to personal financial difficulties” (10.52%). Just over 8% of the participants mentioned that they “might miss interacting with family and friends.” A few (3.16%) mentioned that staying home “might mean I will lose my job.”

In the case of disadvantages, four of the disadvantages had statistically significant regression weights. Three of the perceived disadvantages had negative weights indicating that those who mentioned these disadvantages had lower intentions to stay home.

Facilitators perceived to facilitate staying home. Table 4 presents the regression results predicting intention to stay home from worker status and the 12 perceived facilitators of staying home. The regression resulted in a small but statistically significant adjusted $R^2 = .086$, $F(14, 950) = 7.398$, $p < .001$.

The most frequently mentioned facilitator was “having things to do at home” (17.55%). Participants indicated that leisure activities, such as watching television shows/movies, doing house-related projects, and playing games, might make staying home easier. Many participants mentioned financial and occupational facilitators that might help them follow the stay-at-home orders. “Having

money” was mentioned by 10.41%, including bringing in a paycheck, having a salary, or having money. About 7% of participants mentioned “being able to work from home” (6.87%), and 6.10% mentioned “getting financial assistance” such as receiving a stimulus check, having bills deferred, or having other forms of financial assistance.

Two interpersonal facilitators were mentioned: “living and spending time with someone” (6.16%) and “virtually chatting with others” (2.09%). A few participants mentioned aspects of getting food and other supplies, with 7.24% mentioning “having food and supplies delivered” and 7.26% “having supplies and access to supplies.”

Four of the facilitators showed statistically significant weights indicating they made independent contributions to intention. “Having food and supplies delivered,” “having supplies and access to buy supplies,” and “having things to do at home” showed positive weights, indicating that those who mentioned any of these three facilitators had higher intentions to stay home. The significant negative weight for “having money” suggests that those who mentioned this circumstance had a lower intention to stay home.

Discussion

The purpose of this study was to describe the salient beliefs underlying the decision to stay home and to preliminarily identify which might be determinants of intention. The goal was to support the development of theory-based programs to facilitate adherence to stay-at-home orders and ultimately mitigate the epidemic. The analysis revealed eight salient advantages, 12 disadvantages, and 12 facilitators for staying home for the next month. In addition, 12 of these beliefs were associated with intention and might be operating as causal factors. While the sample had a very positive intention to stay home for

the next month, there is still room for improvement to strengthen the intention.

By and large, the advantages, disadvantages, and facilitators identified in our study are consistent with those found in the one published elicitation study (Owens et al., 2021). Both studies found that the most frequently mentioned advantage were individual health benefits, such as not getting COVID-19, not getting sick from COVID-19, and not dying from COVID-19. Both studies found population health benefits (e.g., keeping others safe) and leisure benefits (e.g., having more time to do home-based activities) to staying home. Participants in both studies mentioned negative consequences across health dimensions, including mental (e.g., depression), social (e.g., isolation), and financial health (e.g., personal finances). Both studies found that supply chain aspects can be facilitators to staying home.

Our study used a better sampling frame and provided more representative results of the U.S. adult population than Owens et al. (2021), who used MTurk. MTurk participants are not generalizable to the U.S. population (Walters et al., 2018). Perhaps because of our larger and more representative sample, we identified beliefs not reported in Owens et al. (2021). In terms of advantages, we found that staying home “might help hospitals and healthcare workers.” In terms of disadvantages, we found that staying home “might lead to weight gain, exercising less, or eating more” or “might not reduce COVID-19.” We also found additional circumstances, such as “having money” or “having financial assistance.”

Overall, in terms of our first aim of identifying underlying beliefs, the advantages, disadvantages, and facilitators of staying home spanned across health domains. Adults in the United States perceived that the epidemic and the behavior of staying home have impacted all aspects of their lives and

have implications beyond COVID-related morbidity/mortality. These broad perceived impacts are consistent with systematic reviews on how the epidemic impacted the economy (Nicola et al., 2020), mental health (Xiong et al., 2020), social health (Clemente-Suárez et al., 2020), and other health behaviors (Ammar et al., 2020). In terms of our second aim, we identified 12 beliefs that were associated with the intention to stay home. As described in the implications below, these beliefs might provide starting places for intervention designs.

Limitations

While this study provides insights into the beliefs underlying the decision of U.S. adults to stay home for the next month, it is important to remember that this is a descriptive, exploratory study with limitations. We measured three and not all six sets of beliefs because we could only add three questions to an existing survey. Beliefs were assessed with a weak measure—percent mentioning in a response to an open-ended question. It was only possible to assess the preliminary relationship to intention, which resulted in small to medium effect sizes (Cohen, 1988). Because we did not have quantitative measures of beliefs, it was not possible to build and test a complete RAA model. Because we used a correlational, cross-sectional design, the results can only indicate association and not causation. The behavior of staying home except to perform essential activities is a complex behavior that means different things to different segments of the population. In addition, the time context was one month, whereas different beliefs might be elicited with orders to stay home for longer periods. We elicited beliefs during April 2020, and beliefs may have shifted since then. Because this was a self-administered survey, there was no

opportunity to probe as would be possible with interviews.

Implications for Health Behavior Theory

Implications for health behavior theory. It is clear from this study and the literature that we need more theoretical tools to help us understand and disentangle complex behaviors like staying home. We need conceptual frameworks and theory-based tools to help us identify and prioritize specific behaviors within broad policies and explore the meanings of these complex behaviors.

Implications for health behavior practice. One purpose of this research was to identify which underlying beliefs to target with interventions. Because the beliefs elicited spanned across health domains, health professionals could consider implementing programs that address dimensions beyond just COVID-related morbidity/mortality. We recommend interventions that address the beliefs that showed significant independent contributions to intention in the regression analyses.

In terms of advantages, findings for the three significant weights suggest that interventions that help people believe that staying home might keep them healthy, help keep others healthy, and slow/stop the spread of COVID might increase their intention to stay home. Communication and educational interventions could begin with benefits for the self and then extend out to the family and then more widely to the community. It may be necessary for people to see that they are part of a community, and that we need to protect the community to protect ourselves and our immediate family. The fourth significant weight was for the advantage that staying home “might allow me to catch up on things.” This finding suggests that it might be useful to promote advantages beyond

reducing COVID-related morbidity/mortality.

In terms of disadvantages, three of the significant weights were occupational and financial disadvantages. Because the weights were negative, these disadvantages were mentioned more frequently by those with lower intention. This suggests that staying-at-home interventions need to address potential occupational and financial concerns. Participants were concerned about losing their jobs and not being able to work. Social programs could protect against financial and occupational loss, and communication programs could ensure people know about these safety net resources. The belief that staying home “might weaken the economy” could be addressed by helping people understand that public health and the economy are related in complex ways and could be complementary rather than contradictory.

The fourth significant weight for disadvantages was the belief that staying home might lead to “missing interacting with family and friends.” This weight was positive, which means it was mentioned more frequently the higher the intention. This finding suggests that high intenders realize that their behavior has disadvantages, but they are willing to perform the behavior regardless. While public health professionals may like to emphasize the advantages and ignore the disadvantages, we might consider acknowledging and addressing disadvantages. In this case, it might be beneficial to help people interact virtually by providing technology, improving technology access, and helping people use technology effectively.

In terms of facilitators, the two supply chain facilitators (“having food and supplies delivered” and “having supplies and access to supplies”) showed significant independent contributions to predicting intention. This suggests that the changes made in our supply

system were beneficial to staying home and implies that we should continue to implement and modify these as the situation changes. These interventions need to have structural components in which delivery and other access mechanisms are implemented, and communication components to help people become aware of these interventions. This study also revealed a leisure facilitator in the form of “having things to do at home.” Communication programs that promote leisure activities, and structural interventions that provide equipment to create a supportive environment, might help people to consistently follow stay-at-home orders, especially those who are not employed.

The fourth significant weight was for the circumstance, “having money.” It was mentioned more frequently by those with a lower intention to stay home. While this finding is difficult to interpret because the relationship is in the opposite direction of what might be expected, it suggests that financial circumstances could play a role in staying home. Just as with the financial and occupational disadvantages described above, occupational and financial interventions are needed. These include work from home policies so people can continue to work and continue to earn an income.

Implications for health behavior research. This study is only the beginning of what needs to be learned to support staying home as an effective strategy to prevent the spread of COVID-19 and other transmissible infections. First, we need to do more research on the behaviors recommended by a policy, in this case the behavior of staying home “except to get food, care for a relative or friend, get necessary health care, go to an essential job, or exercise separately from others.” Qualitative research is needed to unpack the meaning of staying home and the different actions that make up that complex behavior, with the goal to identify a specific

action that is more amenable to communication and change. Second, and for the next stage in the application of the RAA, we need to use beliefs elicited in this study to create closed-ended items for a large-scale, RAA-based quantitative survey. Analyses of this survey with quantitative measures of all RAA constructs could be used to test a model predicting intention from the global constructs, as well as the specific beliefs. It could provide a more accurate assessment of percent of variation explained, of specific beliefs to target, and of differences by worker status. Third, longitudinal research needs to determine how well intention predicts the actual behavior of staying home and compare perceptions now to perceptions in April 2020. Finally, we need to examine the beliefs of policymakers and stakeholders who can influence our environments and implement these structural interventions.

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References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior Human Decision Processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Allegrante, J. P., Auld, M. E., & Natarajan, S. (2020). Preventing COVID-19 and its sequela: "There is no magic bullet...It's just behaviors". *American Journal of Preventive Medicine*, 59(2), 288-292. <https://doi.org/10.1016/j.amepre.2020.05.004>

- Ammar, A., Brach, M., Trabelsi, K., Chtourou, H., Boukhris, O., Masmoudi, L., Bouaziz, B., Bentlage, E., How, D., Ahmed, M., Müller, P., Müller, N., Aloui, A., Hammouda, O., Paineiras-Domingos, L. L., Braakman-Jansen, A., Wrede, C., Bastoni, S., Pernambuco, C. S., . . . Hoekelmann, A. (2020). Effects of COVID-19 home confinement on eating behaviour and physical activity: Results of the ECLB-COVID19 International Online Survey. *Nutrients*, *12*(6), 1583. <https://doi.org/10.3390/nu12061583>
- Armitage, C. J., & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour: A meta-analytic review. *British journal of social psychology*, *40*(4), 471-499. <https://doi.org/10.1348/014466601164939>
- Bigot, A., Banse, E., Cordonnier, A., & Luminet, O. (2021). Sociodemographic, cognitive, and emotional determinants of two health behaviors during SARS-CoV-2 outbreak: An online study among French-speaking Belgian responders during the spring lockdown. *Psychologica Belgica*, *61*(1), 63-78. <https://doi.org/10.5334/pb.712>
- Clemente-Suárez, V. J., Dalamitos, A. A., Beltran-Velasco, A. I., Mielgo-Ayuso, J., & Tornero-Aguilera, J. F. (2020). Social and psychophysiological consequences of the COVID-19 pandemic: An extensive literature review. *Frontiers in Psychology*, *11*, 3077. <https://doi.org/10.3389/fpsyg.2020.580225>
- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). Lawrence Earlbaum.
- Downs, D. S., & Hausenblas, H. A. (2005). Elicitation studies and the theory of planned behavior: A systematic review of exercise beliefs. *Psychology of Sport and Exercise*, *6*(1), 1-31. <https://doi.org/10.1016/j.psychsport.2003.08.001>
- Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. Psychology Press.
- Frounfelker, R. L., Santavicca, T., Li, Z. Y., Miconi, D., Venkatesh, V., & Rousseau, C. (2021). COVID-19 experiences and social distancing: Insights from the theory of planned behavior. *American Journal of Health Promotion*, *35*(8), 1095-1104. <https://doi.org/10.1177/08901171211020997>
- Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health*, *31*, 399-418. <https://doi.org/10.1146/annurev.publhealth.012809.103604>
- Hall, J. P., Shartzter, A., Kurth, N. K., & Thomas, K. C. (2017). Effect of Medicaid expansion on workforce participation for people with disabilities. *American Journal of Public Health*, *107*(2), 262-264. <https://doi.org/10.2105/AJPH.2016.303543>

- Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277-1288.
<https://doi.org/10.1177/1049732305276687>
- IBM Corp. (2016). SPSS Statistical for Windows (Version 27). Retrieved from <https://www.ibm.com/analytics/spss-statistics-software>
- Ipsos. (2020a). *KnowledgePanel® sampling and weighting methodology*. Retrieved from <https://www.ipsos.com/sites/default/files/kpsamplingandweighting.pdf>
- Ipsos. (2020b). *KnowledgePanel®: A methodological overview*. Retrieved from <https://www.ipsos.com/sites/default/files/ipsosknowledgepanelmethodology.pdf>
- Lee, J. C., Mervosh, S., Avila, Y., Harvey, B., & Matthews, A. L. (2020, August 11). See how all 50 states are reopening (and closing again). *The New York Times*. Retrieved from <https://www.nytimes.com/interactive/2020/us/states-reopen-map-coronavirus.html>
- Lin, C. -Y., Imani, V., Majd, N. R., Ghasemi, Z., Griffiths, M. D., Hamilton, K., Hagger, M. S., & Pakpour, A. H. (2020). Using an integrated social cognition model to predict COVID-19 preventive behaviours. *British Journal of Health Psychology, 25*(4), 981-1005.
<https://doi.org/10.1111/bjhp.12465>
- McEachan, R. R. C., Conner, M., Taylor, N. J., & Lawton, R. J. (2011). Prospective prediction of health-related behaviours with the theory of planned behaviour: A meta-analysis. *Health Psychology Review, 5*(2), 97-144.
<https://doi.org/10.1080/17437199.2010.521684>
- McEachan, R. R. C., Taylor, N. J., Harrison, R., Lawton, R., Gardner, P., & Conner, M. (2016). Meta-analysis of the reasoned action approach (RAA) to understanding health behaviors. *Annals of Behavioral Medicine, 50*(4), 592-612.
<https://doi.org/10.1007/s12160-016-9798-4>
- McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica, 22*(3), 276-282.
<https://hrcak.srce.hr/89395>
- Middlestadt, S. E. (2012). Beliefs underlying eating better and moving more: Lessons learned from comparative salient belief elicitations with adults and youths. *The Annals of the American Academy of Political and Social Science, 640*(1), 81-100.
<https://doi.org/10.1177/0002716211425015>
- Middlestadt, S. E., Bhattacharyya, K., Rosenbaum, J., Fishbein, M., & Shepherd, M. (1996). The use of theory based semistructured elicitation questionnaires: Formative research for CDC's Prevention Marketing Initiative. *Public Health Reports, 111*(1, Suppl.), 18-27.
- Nguyen, K. H., Srivastav, A., Razzaghi, H., Williams, W., Lindley, M. C., Jorgensen, C., Abad, N., Singleton, J. A. (2021). COVID-19 vaccination intent, perceptions, and reasons for not vaccinating

- among groups prioritized for early vaccination—United States, September and December 2020. *American Journal of Transplantation*, 21(4), 1650-1656.
<https://doi.org/10.1111/ajt.16560>
- Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., Agha, M., & Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International Journal of Surgery*, 78, 185-193.
<https://doi.org/10.1016/j.ijvs.2020.04.018>
- Norman, P., Wilding, S., & Conner, M. (2020). Reasoned action approach and compliance with recommended behaviours to prevent the transmission of the SARS-CoV-2 virus in the UK. *British Journal of Health Psychology*, 25(4), 1006-1019.
<https://doi.org/10.1111/bjhp.12474>
- Owens, C., Hunter-Mullis, K., Macy, J. T., Dickinson, S., & Middlestadt, S. E. (in press). Beliefs underlying US adults' intention to stay home during the COVID-19 pandemic. *Health Behavior and Policy Review*.
- Owens, C., Struble, N., Currin, J. M., Giano, Z., & Hubach, R. D. (2021). Beliefs about social distancing during COVID-19 stay-at-home orders: A theory-based salient belief elicitation. *Health Behavior Research*, 4(1).
<https://doi.org/10.4148/2572-1836.1094>
- Pei, S., Kandula, S., & Shaman, J. (2020). Differential effects of intervention timing on COVID-19 spread in the United States. *Science Advances*, 6(49), eabd6370.
<https://doi.org/10.1126/sciadv.abd6370>
- Steinmetz, H., Knappstein, M., Ajzen, I., Schmidt, P., & Kabst, R. (2016). How effective are behavior change interventions based on the theory of planned behavior? A three-level meta-analysis. *Zeitschrift für Psychologie*, 224(3).
<https://doi.org/10.1027/2151-2604/a000255>
- Sturman, D., Auton, J. C., & Thacker, J. (2020). Knowledge of social distancing measures and adherence to restrictions during the COVID-19 pandemic. *Health Promotion Journal of Australia*, 32(2), 344-351.
<https://doi.org/10.1002/hpja.443>
- Tabibi, Z., Abedini, E., Gholipour, F., Hojjat, S. K., & Amini, M. (2021). The influence of demographic features and psychological constructs on observing government-advised preventive measures for COVID-19: The case of Iran. *Journal of Iranian Medical Council*, 4(1), 39-48.
<https://doi.org/10.18502/jimc.v4i1.5741>
- Walters, K., Christakis, D. A., & Wright, D. R. (2018). Are Mechanical Turk worker samples representative of health status and health behaviors in the US? *PLoS ONE*, 13(6), e0198835.
<https://doi.org/10.1371/journal.pone.0198835>
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M. W., Gill, H., Phan, L., Chen-Li, D., Jacobucci, M., Ho, R., Majeed, A., & McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, 277, 55-64.
<https://doi.org/10.1016/j.jad.2020.08.001>