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Privacy Paradox: The Impact A Health Crisis Has on Individual Views Regarding Privacy and Data Collection

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The Impact of A Health Crisis: Re-examining Privacy Behavior

**Privacy Paradox: The Impact A Health Crisis Has on Individual Views Regarding Privacy
and Data Collection**

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Thesis Advisor: Professor Ermira Zifla PhD

Honors Thesis submitted to the Peter T. Paul College of Business and Economics

University of New Hampshire

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Introduction

There is a growing need to explore what drives an individual's willingness to share, or hide, their personal information (Acquisti, 2009). Technological advancements within the last century have expanded information sharing and data mining capabilities, earning this period the title of "the information age" (Alessandro Acquisti, n.d.). Specifically, concerning the last year, the COVID-19 pandemic has resulted in further developed technologies to help control and reduce the spread of the SARS-CoV-2 virus (Gvili, 2020). For example, tech giants Apple and Google have implemented a platform known as the Privacy-Preserving Contact Tracing Project in which they have announced their initiative to build an interoperable COVID-19 contact tracing platform into their software updates (Gvili, 2020). The advanced computation models created by big data companies in light of the global health crisis show great promise in tracing the source and preventing future spread of the virus. It therefore essential for these companies to utilize their intelligent analytics abilities for the benefit of global health (Ienca & Vayena, 2020).

Although there are many benefits associated with the capabilities of these new technologies, the tradeoff comes in relation to concern of user privacy. Many individuals express an aura of uneasiness with the current collection and storage processes of sensitive information, not wanting their personal statistics to end up falling into the wrong hands (i.e., insurance providers/employers) (Fox, 2020). There is an inconsistency between individual actions in relation to what they say they want in terms of privacy. This difference in user beliefs and their associated actions is known as the privacy paradox and is a topic data experts are proficient in (Fox, 2020). The COVID-19 pandemic has opened an opportunity to analyze the privacy paradox in a new light. How does a healthcare crisis, like the COVID-19 pandemic, affect individual privacy decisions?

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Traditional studies suggest individuals are autonomous beings who can make rational decisions to manage their own privacy (Acquisti & Grossklags, 2005). It is assumed an individual is both forward-looking and fully informed when deciding how to protect, or share, their personal information (Acquisti & Grossklags, 2005). Studies have shown, however, that even with sufficient information, individuals often lack enough understanding to make rational decisions regarding their privacy (Acquisti & Grossklags, 2005). It has also been found many individuals who claim to hold a high valuation of privacy are likely to trade long-term privacy for a short-term benefit (Acquisti & Grossklags, 2005). These findings directly correlate with the new data collection processes that have accompanied the COVID-19 pandemic. Users directly benefit from these algorithms as they receive specialized alerts informing them of exposure to the virus (Sharon, 2020). It is important to discover if users perceive this benefit to outweigh the risks associated with sharing personal information. There must be a level of trust established within these tracing platforms to assist in their global acceptance. To do this, the principle of proportionality should be applied in the data collection process. Under this aid, information collected must : (i) be proportional to the seriousness of the public health threat, (ii) be limited to what is necessary to achieve a specific public health objective, and (iii) be scientifically justified (Ienca & Vayena, 2020). Compliance with the principle of proportionality will mitigate mistrust in this data collection process as individuals will be informed as to what data is being collected, why it is being collected, and for what purpose the data is being collected.

The purpose of this paper is to measure the impact a health crisis has on individual valuation of personal health data in the context of user privacy. It is important to investigate this topic to understand if, and when, individuals are more willing to share their personal health-related information to benefit both themselves and the general public. I created a survey to

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investigate the net effect the COVID-19 pandemic has had on individual privacy valuation. The results of my analysis provide insight into how gender impacts acceptance of the new precautionary measures enacted to tackle the spread of COVID. These new findings will help researchers analyze the privacy paradox in a new light, allowing for a better understanding of what impact the pandemic has had on an individual's valuation of health-related privacy over the last few years.

Conceptual Development

Definition of Privacy:

Meaning Different Things to Different People/ Fields: The biggest issue associated with the “information age” is privacy (Alessandro Acquisti, n.d.). Almost all activities an individual engages in, ranging from work emails to dating apps to a simple google search, leave some sort of trace. Individuals reveal information about themselves through these activities, whether they realize it or not, to each other, corporations, and the government. It is important to realize the benefits associated with advancements in technology are accompanied by the acceleration of abilities to analyze, aggregate, and draw conclusions from user data (Alessandro Acquisti, n.d.). The current data collection and storage processes ultimately render one's past decisions inerasable. No two people, businesses, or governments have the same definition of privacy. From the data collection perspective, privacy can be defined as an individual's desire for greater control over their personal information (Fox, 2020). From the healthcare perspective, privacy is known as an individual's desire to be afforded greater control over the collection and dissemination of their personal health information by healthcare organizations and technology vendors (Fox, 2020). The specificity of the definition varies between realms, further adding to the misunderstandings revolving around the privacy paradox.

External Factors Affecting Individual Privacy Interpretation: Individual privacy boundaries differ based on numerous external factors. Cultural beliefs have a large impact on the interpretation of individual privacy (Alessandro Acquisti, n.d.). Even within specific cultures, individuals have different levels of privacy concerns and what information they consider to be private (Alessandro Acquisti, n.d.). These different levels of privacy concerns stem from personal attitudes, knowledge of risks and protection, trust in other parties, faith in the ability to protect information, and monetary considerations (Acquisti & Grossklags, 2005). It is also important to understand the effect external factors have on the degree to which individual privacy concerns are influenced. Acquisti analyzes three themes to better understand this paradox including uncertainty about the consequences associated with data sharing, context-dependence leniencies impacting individual concern about privacy, and the degree to which privacy concerns are influenced by commercial and government interests (Alessandro Acquisti, n.d.). It is important to understand the impact external factors have on the notion of privacy to better understand how individuals' perceptions of privacy change during a health crisis.

Privacy Paradox:

In a study conducted by Alessandro Acquisti [2004], he discovered a concerning number of individuals are extremely uneducated on the topic of technological or legal forms of privacy protection (Acquisti & Grossklags, 2005). This study directly correlates to ideas revolving around the privacy paradox as most respondents claimed to be very wary of personal privacy, yet most were unaware of the correct steps to protect their personal data. Acquisti's results showed over 70% of respondents could not describe the steps needed to browse the Internet anonymously, ultimately lacking the knowledge revolving around preventing others from identifying personal IP addresses. Similarly, 41% of respondents disclosed they rarely read the

privacy policies and terms of use websites and applications provide. Even if individuals are aware of the extent to which their data is being harbored, privacy policies are often written in a language too complex for the human brain to comprehend. The inability to process the storage and collection processes outlined in the terms of use results in most users being unaware of the amount of personal data they share and how that data can be used (Acquisti & Grossklags, 2005).

How Privacy Concerns Impact the Adoption of New Technologies for Healthcare:

In recent years, wearable health-related technologies have become increasingly more popular. Devices such as Apple watches, Fitbits, Garmins, and Nike sports watches now make up a 40.65 billion USD market [2020] (*Wearable Technology Market Size Analysis Report 2021-2028*, n.d.). These devices are extremely popular among healthcare professions and individuals who value their physical wellbeing. Based on the data collected through these devices, comprehensive reports can be drawn up to help analyze a patient's physical wellbeing in real-time. Having direct access to reports generated by these devices encourages individuals to take control of their health practices. Many have adopted these wearable health devices without any issues, appreciative of the timely reports they can analyze without having to go to a doctor. Others, however, have expressed their concern with the privacy features embedded in these designs. In a survey conducted by Fox (Fox, 2020), respondents helped to understand how individuals perceive the use of wearable health technologies and their associated privacy concerns. Her analysis uncovered many concerns revolving around sharing health data with big data companies. There seemed to be a new level of fear associated with sharing health information as, "it is what makes up a person." Other individuals expressed their concerns regarding the belief technology companies would sell their individual health data for profit without user consent. Many also feared that data breaches could result in personal information

ending up in the wrong hands, having a negative impact on their future selves (Fox, 2020). Until there is a clear understanding of how the big data companies will harbor individual health data, it is safe to conclude there will be a certain level of hesitancy around full acceptance for some individuals. Health offices and wearable technology companies must find ways to establish a deep level of trust in these wearable health devices to assist in their acceptance.

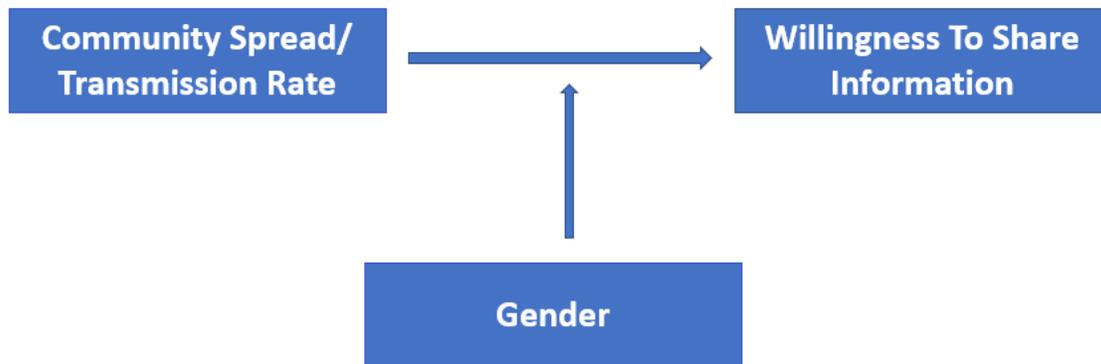
How Gender Impacts Health:

In the United States, studies show men live shorter lives than females, dying nearly 5.2 years younger on average (Pinkhasov et al., 2010). Men have higher death rates for twelve out of the fifteen leading causes of death in the US. This difference in life expectancy can be attributed to significant gender discrepancies and disease morbidity (Pinkhasov et al., 2010). Studies show the male valuation of self-reliance, physical toughness, and emotional control outweigh their willingness to pursue professional medical attention (Pinkhasov et al., 2010). Additionally, men are likely to engage in heavy drinking more frequently than women and are less likely to quit smoking, putting them more at risk for acute and chronic health conditions (Pinkhasov et al., 2010). It is hypothesized high-risk behaviors paired with minimal pursuit of professional medical health services contribute to the significantly lower life expectancies for the male population.

Data collected from China, Italy, Spain, South Korea, and Europe show men are more likely to die of COVID than women are. In Italy, only 29% of the COVID-related deaths were female, and Spain registered two times as many male deaths as female throughout the pandemic (Biswas, 2020). Studies suggest estrogen and the double X chromosome found in the female body elevate the immune system, serving as an extra shield against viral infections. Apart from the lack of genetic benefits, men are also less likely to maintain hygienic practices as compared to women. The reluctance of handwashing, mask compliance, and sanitizing cannot be ruled out

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as explanations for why the COVID-19 virus has a much more detrimental effect on the male population (Biswas, 2020). Further analysis of how gender impacts individual willingness to share health data to prevent the spread of COVID will be analyzed through the diagram below:



Method

This study is designed to investigate the extent to which a health crisis, like the COVID-19 pandemic, affects individual privacy concerns. After obtaining IRB approval and developing a survey tool using both validated and new questions, the survey was distributed through the Qualtrics platform. Two different pools were targeted, including University of New Hampshire students and paid respondents through Amazon Mechanical Turk, generating 220 total responses for analysis. To be eligible to partake in this survey, respondents had to be at least 18 years of age.

This survey used a seven-point Likert scale to rank individual judgments relating to privacy concerns and the severity of COVID from low to high. ANOVA testing was conducted through IBM's SPSS platform to analyze the significance of the response data. ANOVAS help identify differences in the data by analyzing the levels of variance within groups (*ANOVA Test*, 2022).). To identify if any differences between the means are statistically significant, it is important to compare the calculated p-value with the declared significance level. Consistent with

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prior research, I use a p-value of 0.05 as the cutoff for the significance level. If the p-value is less than or equal to the 5% significance level, conclude the differences between the means are statistically significant. If the p-value is greater than the 5% significance level, conclude the differences between the means are not statistically significant (*Interpret the Key Results for One-Way ANOVA*, n.d.).

Procedure

Participants were first provided with the informed consent document detailing all the information needed for the individual to make a conscious decision to participate in this research study. The survey then randomly prompted three different scenarios informing the user if cases were rising, falling, or not significant (the control) in their area. The following prompts outline the three possible scenarios:

Control: Covid has impacted many lives since March 2020. Individuals have needed to social distance, wear masks, and work remotely per the CDC guidelines. Especially during a pandemic, it is essential to take care of yourself and others. Covid has impacted what individuals do to maintain a healthy lifestyle. It has challenged individual ability to maintain a physical and mental sense of well-being.

Increasing Cases: Covid has impacted many lives since March 2020. Individuals have needed to social distance, wear masks, and work remotely per the CDC guidelines. Especially during a pandemic, it is essential to take care of yourself and others. Covid has impacted what individuals do to maintain a healthy lifestyle. It has challenged individual ability to maintain a physical and mental sense of well-being. Imagine the CDC published a statement saying covid cases are **rising** in your area.

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Decreasing Cases: Covid has impacted many lives since March 2020. Individuals have needed to social distance, wear masks, and work remotely per the CDC guidelines. Especially during a pandemic, it is essential to take care of yourself and others. Covid has impacted what individuals do to maintain a healthy lifestyle. It has challenged individual ability to maintain a physical and mental sense of well-being. Imagine the CDC published a statement saying covid cases are **falling** in your area.

Following the manipulation, respondents were then asked a series of questions to measure the impact the independent variable and select moderators have on the dependent variable (willingness to share information).

Results

Descriptive Statistics:

Out of the 220 survey respondents:

- Males represented 50.9% of total respondents. Females represented 49.1%.
- When asked to evaluate current health status on a scale from ‘very poor’ to ‘excellent’, 1.3% of respondents answered ‘poor’, 13.6% of respondents answered ‘fair’, 56.4% of respondents answered ‘good’, and 28.6% of respondents answered ‘excellent’.

Analysis:

The purpose of this study was to investigate the effect a health crisis like COVID-19 has on individual privacy concerns. More specifically, this survey was designed to investigate the relationship between case numbers in the respondent’s area and their willingness to share health data to prevent the further spread of the virus. A logical conclusion was to expect the data to align with the initial survey manipulation, showing individuals are more willing to share their personal health information when cases are rising in their area, and less willing to share their

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health information when cases are falling in their area. After an in-depth analysis, the data does not back this conclusion and there are no statistically significant relationships between the community spread and an individual's willingness to share information. This unexpected result can be explained by two possible scenarios. First, respondents may not have fully read the randomized initial prompt informing them of case numbers in their area. The following is a summary of the randomized community spread in relation to the manipulation check presented at the end of the survey:

	Control	High	Low	Total
Increasing	13	44	24	81
Decreasing	6	12	38	56
Control	52	18	13	83
Total	71	74	75	220

The results showed only 59.45% of respondents presented with increasing case numbers in their area answered correctly when asked to recall the initial manipulation. Further, 50.6% of respondents presented with decreasing case numbers correctly remembered cases were decreasing in their area. The control group consisted of 73.25% of respondents correctly recalling there was no mention of case numbers presented when their version of the survey began. A second possible explanation as to why there were no statistically significant conclusions drawn in relation to the community spread could be explained by respondents having preconceived notions about COVID. Individuals may believe the COVID-19 virus is a hoax and rising infection levels in their area will not lead them to be more willing to share their personal health data. Alternatively, individuals may believe the symptoms of the SARS-CoV-2 virus are the deadliest the world has seen in years, making them more accepting of precautionary measures being taken in their area no matter the presented case numbers.

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Although the manipulation did not produce any significant conclusions, gender proved to be a viable metric for analysis. Research proves men are more likely to die from COVID than females are as, they are much less proactive in terms of health (Pinkhasov et al., 2010). Based on response data, it can be concluded men are also less accepting of precautionary measures being enacted to prevent the spread of COVID. The following is a summary of the impact gender has on willingness to accept vaccine passports:

DV: Willingness to Accept Vaccine Passports				
			95% Confidence Interval	
	Mean	Std Error	Lower	Upper
Female	4.75	0.186	4.383	5.117
Male	4.17	0.183	3.809	4.53
Statistical Significance		0.027		

For this question the scale ranged from 1 being ‘very unwilling’ to 7 being ‘very willing’. The data shows females are much more willing to accept vaccine passports than men are, aligning with the conclusion men are less likely to take preventative action when it comes to health-related decisions.

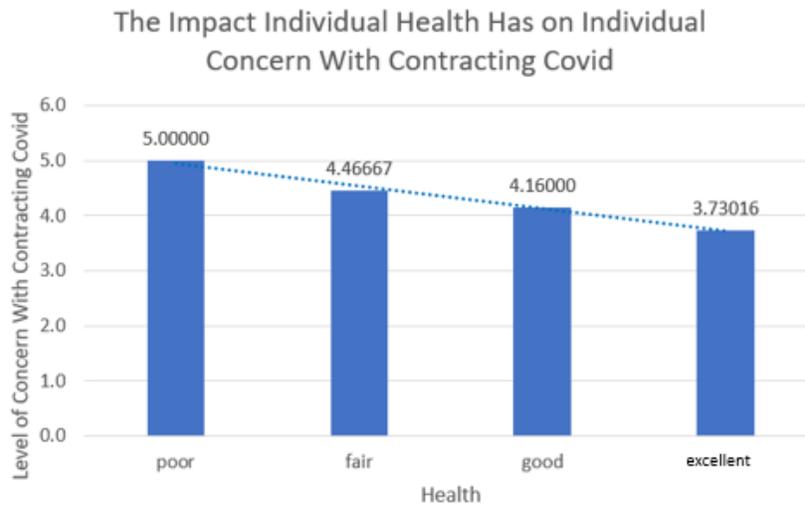
The response data also shows females are also more willing to disclose their vaccine status to their employer. The following represents the impact gender has on willingness to share personal health information:

DV: Willingness to Disclose Vaccine Status to Employer				
			95% Confidence Interval	
	Mean	Std Error	Lower	Upper
Female	4.037	0.173	3.695	4.379
Male	4.804	0.170	4.468	5.139
Statistical Significance		0.002		

For this question, individuals were asked to state how much they agreed or disagreed with the following statement: “I should not have to disclose my personal vaccine information to my employer.” The scale ranged from 1 being ‘strongly disagree’ and 7 being ‘strongly agree’. The data finds males are less willing to share their vaccination status with their employers. This finding can be justified through the response data showing women believe COVID symptoms are much more severe than men. Even with research proving women have the genetic upper hand, men are much less proactive in terms of keeping themselves healthy.

Analysis was conducted to understand how an individual’s valuation of their current health status impacts willingness to share personal health information. The following is a depiction of how health levels impact an individual’s concern with contracting COVID:

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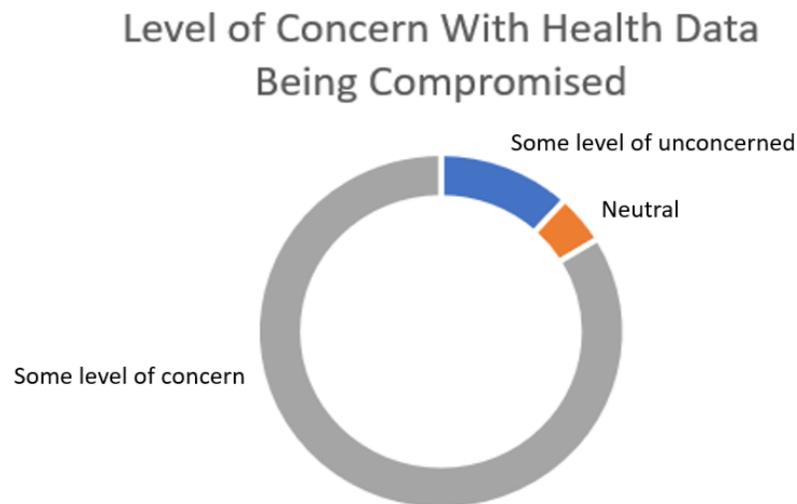
As expected, healthier individuals are less worried about contracting COVID, no matter the gender. Implications arise when an individual with preexisting health conditions contracts COVID, which explains the higher level of concern for individuals with ‘poor’ health. Although the numbers show a trendline, there is no statistically significant conclusion to be drawn from this chart because the p-value is too high. This is nonconclusive because most respondents answered their health is in ‘good’ or ‘excellent’ condition. The following is a summary of individual responses when asked to rate their current health levels:

How Good Is Your Health Right Now?	
Very Poor	0
Poor	3
Fair	30
Good	124
Excellent	63

The conclusion drawn from the three respondents representing the ‘poor’ health group is not representative of everyone who truly has poor health. No statistical conclusions can be drawn with health levels acting as the moderator.

Discussion

This study found females are more willing to accept the precautionary measures being implemented to combat the spread of COVID. Not only are they more willing to share their personal health information, but they believe the pandemic to be more severe than men do. These findings are beneficial to further analyze the privacy paradox in a new light. Although many individuals are concerned with having their health data breached, many are still willing to share their personal data through contact tracing applications to prevent the spread of COVID.



These findings fully captivate the essence of the privacy paradox, as stated privacy concerns do not align with actual behavior in disclosing private health information.

The results from this survey are important for many different groups of individuals to analyze. Employers now know females are more willing to disclose their vaccine status than males in the workplace. They can use this knowledge to target male employees when explaining the rationality behind the disclosure of personal health information in effort to keep employees healthy in the office. It is now known females are more accepting of this precautionary measure to prevent the spread of COVID and need less justification when asked to disclose vaccine information. Government officials now know males are more likely to reject the implementation

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of vaccine passports to travel. They can take this knowledge and pair it with the research concluding men are more likely to die from COVID than women to help assist in the transitional process. Numbers are dependable and the truest indicators of reason, and now officials can prepare arguments for why men should be especially accepting of this precautionary measure to prevent higher transmission levels. Nurses and doctors can take this information to understand if men are more likely to engage in high-risk behaviors and reject preventative practices, then hospital admission rates will be largely male dominated. This knowledge may assist in staffing decisions and identify which medical equipment is most needed to help treat male COVID patients. Big tech companies, like Apple and Google, who have implemented contact tracing software into their system updates now realize although most individuals are concerned of data breaches, they are still willing to share personal information to prevent the spread of COVID. Tech companies must validate the security of their platforms to assist in further acceptance.

Conclusion

The purpose of this paper was to analyze the privacy paradox in the context of a health crisis to understand how a virus affects individual willingness to share health data. As more countries are implementing digital technologies to log and analyze personal health data, it is essential to understand the public perception of these platforms. Although most individuals of both genders are fearful of data breaches, research from my study concludes females are more willing to accept the transition toward health-related technologies. Specifically in the context of COVID women understand the symptoms to be more severe than men do, thus making them more proactive when it comes to taking preventative actions. My research shows women are more willing to accept the implementation of vaccine passports, more accepting of vaccine

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mandates to help keep employees healthy in the workplace and are more willing to disclose their personal health-related information to their employers.

To aid in further acceptance of health-related data collection processes, data companies must utilize their intelligence analytics to ensure logging methods are secure and harvesting practices are up to par to prevent data breaches. Further, individuals must educate themselves on the privacy policies associated with big tech companies to ensure the security of their personal health data. To specifically improve male acceptance, doctors and nurses must educate their male patients to share the global toll COVID has taken on the male population. Not only are men more genetically at risk, but they are more likely to engage in high-risk activities which further impacts their ability to recover from this virus. Transparent data collection practices paired with detailed research to educate individuals, will likely result in people trusting big tech companies to analyze their personal health data to prevent the further spread of COVID.

References

- Acquisti, A. (2009). Nudging Privacy: The Behavioral Economics of Personal Information. *IEEE Security Privacy*, 7(6), 82–85. <https://doi.org/10.1109/MSP.2009.163>
- Acquisti, A., & Grossklags, J. (2005). Privacy and Rationality in Individual Decision Making. *IEEE Security Privacy*, 3(1), 26–33. <https://doi.org/10.1109/MSP.2005.22>
- Alessandro Acquisti. (n.d.). *Privacy and Human Behavior in the Age of Information*. Retrieved November 5, 2021, from <https://www.science.org/doi/abs/10.1126/science.aaa1465>
- ANOVA Test: Definition & Uses (Updated 2022)*. (n.d.). Qualtrics. Retrieved May 2, 2022, from <https://www.qualtrics.com/experience-management/research/anova/>
- Barth, S., & de Jong, M. D. T. (2017). The privacy paradox – Investigating discrepancies between expressed privacy concerns and actual online behavior – A systematic literature review. *Telematics and Informatics*, 34(7), 1038–1058. <https://doi.org/10.1016/j.tele.2017.04.013>
- Biswas, R. (2020). Are Men More Vulnerable to Covid-19 as Compared to Women? *Biomedical Journal of Scientific & Technical Research*, 27(2). <https://doi.org/10.26717/BJSTR.2020.27.004481>
- Fox, G. (2020). “To Protect My Health or to Protect My Health Privacy?” a Mixed-Methods Investigation of the Privacy Paradox. *Journal of the Association for Information Science and Technology*, 71(9), 1015–1029. <https://doi.org/10.1002/asi.24369>
- Gvili, Y. (2020). *Security Analysis of the Covid-19 Contact Tracing Specifications by Apple Inc. And Google Inc.* 17.
- Ienca, M., & Vayena, E. (2020). On the Responsible Use of Digital Data to Tackle the Covid-19 Pandemic. *Nature Medicine*, 26(4), 463–464. <https://doi.org/10.1038/s41591-020-0832-5>

The Impact of A Health Crisis: Re-examining Privacy Behavior

Interpret the key results for One-Way ANOVA. (n.d.). [Mtbtopic]. Retrieved May 9, 2022, from

<https://support.minitab.com/en-us/minitab-express/1/help-and-how-to/modeling-statistics/anova/how-to/one-way-anova/interpret-the-results/key-results/>

Pinkhasov, R. M., Wong, J., Kashanian, J., Lee, M., Samadi, D. B., Pinkhasov, M. M., & Shabsigh, R.

(2010). Are men shortchanged on health? Perspective on health care utilization and health risk behavior in men and women in the United States. *International Journal of Clinical Practice*, 64(4), 475–487. <https://doi.org/10.1111/j.1742-1241.2009.02290.x>

Sharon, T. (2020). Blind-Sided by Privacy? Digital Contact Tracing, the Apple/Google Api and Big

Tech’s Newfound Role as Global Health Policy Makers. *Ethics and Information Technology*. <https://doi.org/10.1007/s10676-020-09547-x>

Wearable Technology Market Size Analysis Report 2021-2028. (n.d.). Retrieved December 11, 2021,

from <https://www.grandviewresearch.com/industry-analysis/wearable-technology-market>

Xiao-Bai Li, Xiaoping Liu, & Luvai Motiwalla. (2021). Valuing Personal Data with Privacy

Consideration. *Decision Sciences*, 52(2).

Appendix

IRB Approval Letter:

Mar 17, 2022 3:43:11 PM EDT

Jessica Walsh
Dean of Paul College, Decisions Sciences

Study Title: Honors Thesis Survey Application
IRB #: IRB-FY2022-281
Approval: March 17, 2022

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved the protocol for your study as Exempt as described in Title 45, Code of Federal Regulations (CFR), Part 46, Subsection 104(d). Approval is granted to conduct your study as described in your protocol.

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Researchers who conduct studies involving human subjects have responsibilities as outlined in the document, [Responsibilities of Directors of Research Studies Involving Human Subjects](#). Please read this document carefully before commencing your work involving human subjects.

Note: IRB approval is separate from UNH Purchasing approval of any proposed methods of paying study participants. Before making any payments to study participants, researchers should review the Payment of Incentives/ Compensation to Research Participants [guidance](#) to ensure they are complying with institutional requirements. If such institutional requirements are not consistent with the confidentiality or anonymity assurances in the IRB-approved protocol and consent documents, you may need to request a modification from the IRB.

Upon completion of your study, please submit a study closure form through [Cayuse IRB/Human Ethics](#) along with a report of your findings.

If you have questions or concerns about your study or this approval, please feel free to contact Melissa McGee at 603-862-2005 or melissa.mcgee@unh.edu. Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,



Julie F. Simpson
Director

Survey:

- **Personal Data Valuation:** Compared to other types of personal information about you - like financial information- how important is the privacy of your health data to you?
 - 1) Very unimportant
 - 2) Unimportant
 - 3) Somewhat unimportant
 - 4) Neutral
 - 5) Somewhat important
 - 6) Important
 - 7) Very important

- **Data Sensitivity:** How concerned would you be if your health data were compromised, such as through a security breach at the company?
 - 1) Very unconcerned
 - 2) Unconcerned
 - 3) Somewhat unconcerned
 - 4) Neutral
 - 5) Somewhat concerned
 - 6) Concerned

7) Very concerned

- **Black Market Data Value:** Compared to other types of personal information about you – like financial information- how important do you think your health data is on the black market?
 - 1) Very unimportant
 - 2) Unimportant
 - 3) Somewhat unimportant
 - 4) Neutral
 - 5) Somewhat important
 - 6) Important
 - 7) Very important

- **Data Sharing:** How willing are you to share your personal data – location and positive test information- on contact tracing applications to prevent the spread of covid?
 - 1) Very unwilling
 - 2) Unwilling
 - 3) Somewhat unwilling
 - 4) Neutral
 - 5) Somewhat willing
 - 6) Willing
 - 7) Very willing

Moderators:

- **Interpreted Effectiveness of Data Platforms:** Based on other precautionary measures being taken to combat covid, how effective do you believe contact tracing apps are?
 - 1) Very ineffective
 - 2) Ineffective
 - 3) Somewhat Ineffective
 - 4) Neutral
 - 5) Somewhat effective
 - 6) Effective
 - 7) Very effective

Data Sharing: How willing are you to accept the implementation of vaccine passports to prevent the spread of covid?

- 1) Very unwilling
- 2) Unwilling
- 3) Somewhat unwilling
- 4) Neutral
- 5) Somewhat willing
- 6) Willing
- 7) Very willing

Data Sharing: How willing do you think others should be to share their personal data - location and positive test information- on contact tracing apps to prevent the spread of covid?

- 1) Very unwilling
- 2) Unwilling
- 3) Somewhat unwilling
- 4) Neutral
- 5) Somewhat willing
- 6) Willing
- 7) Very willing

Perception of Pandemic: Compared to other viruses, how severe is your perception of covid?

- 1) Very mild
- 2) Mild
- 3) Somewhat mild
- 4) Neutral
- 5) Somewhat severe
- 6) Severe
- 7) Very severe

Data Collection Process: Based on past experiences with wearable health technologies - Fitbits, Apple watches- how secure do you think the data harvesting process is?

- 1) Very unsecure
- 2) Unsecure
- 3) Somewhat unsecure
- 4) Neutral
- 5) Somewhat secure
- 6) Secure
- 7) Very secure

Perception of Pandemic: How much influence do you believe preexisting health conditions have on an individuals actions to prevent contracting covid?

- 1) Very insignificant
- 2) Insignificant
- 3) Somewhat insignificant
- 4) Neutral
- 5) Somewhat significant
- 6) Significant
- 7) Very significant

How much do you agree/disagree with the following statements?

Perceived Security: I am concerned with contracting covid.

- 1) Strongly Disagree
- 2) Disagree

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- 3) Somewhat disagree
- 4) Neither agree nor disagree
- 5) Somewhat agree
- 6) Agree
- 7) Strongly Agree

Perceived Security: Individuals with preexisting health conditions should be more cautious about contracting covid because they are more at risk.

- 1) Strongly Disagree
- 2) Disagree
- 3) Somewhat disagree
- 4) Neither agree nor disagree
- 5) Somewhat agree
- 6) Agree
- 7) Strongly Agree

Experience: My past experiences with covid (individual or others) have made me more covid cautious.

- 1) Strongly Disagree
- 2) Disagree
- 3) Somewhat disagree
- 4) Neither agree nor disagree
- 5) Somewhat agree
- 6) Agree
- 7) Strongly Agree

Geographic Impact: Living in a dense city perpetuates the spread of covid.

- 1) Strongly Disagree
- 2) Disagree
- 3) Somewhat disagree
- 4) Neither agree nor disagree
- 5) Somewhat agree
- 6) Agree
- 7) Strongly Agree

Financial Impact: Financial status impacts individual interpretation regarding the severity of the pandemic.

- 1) Strongly Disagree
- 2) Disagree
- 3) Somewhat disagree
- 4) Neither agree nor disagree
- 5) Somewhat agree
- 6) Agree

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7) Strongly Agree

Perceived Security: Vaccine mandates are essential for companies to implement because they keep their employees safe and prevent the spread of covid.

- 1) Strongly Disagree
- 2) Disagree
- 3) Somewhat disagree
- 4) Neither agree nor disagree
- 5) Somewhat agree
- 6) Agree
- 7) Strongly Agree

Health Privacy: I should not have to disclose my personal vaccine information to my employer.

- 1) Strongly Disagree
- 2) Disagree
- 3) Somewhat disagree
- 4) Neither agree nor disagree
- 5) Somewhat agree
- 6) Agree
- 7) Strongly Agree

Political Impact: Political affiliation impacts personal perception on the severity of the pandemic.

- 1) Strongly Disagree
- 2) Disagree
- 3) Somewhat disagree
- 4) Neither agree nor disagree
- 5) Somewhat agree
- 6) Agree
- 7) Strongly Agree

Data Harvesting: I know what is being done with my data being stored on the contact tracing application platforms.

- 1) Strongly Disagree
- 2) Disagree
- 3) Somewhat disagree
- 4) Neither agree nor disagree
- 5) Somewhat agree
- 6) Agree
- 7) Strongly Agree

Perceived Health: In general, how is your health right now.

- 1) Very poor
- 2) Poor

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- 3) Fair
- 4) Good
- 5) Excellent

Demographics:

Please state your age: _____

Please state your preferred gender: _____

Please enter your state of residence: _____