

## Chapter 12

# Statistical Hypothesization and Predictive Modeling of Reactions to COVID-19– Induced Remote Work: Study to Understand the General Trends of Response to Pursuing Academic and Professional Commitments

**Arjun Sharma**

*Vellore Institute of Technology,  
Chennai, India*

**Om Prakash Swain**

*Vellore Institute of Technology,  
Chennai, India*

**Hemanth Harikrishnan**

*Vellore Institute of Technology,  
Chennai, India*

**Utkarsh Utkarsh**

*Vellore Institute of Technology,  
Chennai, India*

**Sathiya Narayanan Sekar**

*Vellore Institute of Technology,  
Chennai, India*

**Akshay Giridhar**

*Vellore Institute of Technology,  
Chennai, India*

### ABSTRACT

*The initial outbreak of the coronavirus was met with lockdowns being enforced all over the world in March 2020. A prominent change in human lifestyle is the shift of professional and academic work to online platforms, as opposed to previously attending to them in person. As with any major change, the implementation of complete remote work and study is expected to affect different people differently. Through the results of a questionnaire designed as per the implications of the self-*

DOI: 10.4018/978-1-6684-3843-5.ch012

*efficacy theory shared with people who were either students, working professionals, entrepreneurs, or homemakers aged between 12 and 60 years, the authors perform statistical analysis and subsequently hypothesize how different aspects of remote work affect the population from a mental standpoint using t-test, with respect to their professional or academic work. This is followed by predictive modelling through machine learning algorithms to classify working preference as ‘remote’ or ‘in-person’.*

## **INTRODUCTION**

COVID-19 has spread across the world, with the World Health Organization terming it a ‘pandemic’ in March 2020 (World Health Organization, 2020). It has infected over 238 million across the globe, killing at least 4.8 million as of October 2021 (Worldometers.info, 2021). To reduce the spread and impact of the disease, government sanctioned lockdowns were imposed. The lockdowns were accompanied by the adoption of remote work and study alternatives.

This work focuses on understanding the effect of various aspects of complete remote work through means of a survey answered by 450 respondents aged between 12 and 60 years across India. At the time of data collection, all the participants were WFH full-time. Participation in the research was voluntary, anonymous, and without any reward. The process of data collection was in full compliance of the declaration of Helsinki (World Medical Association Declaration of Helsinki, 2013). The questionnaire comprises of questions modelled on the basis of the implications of the self-efficacy theory and its 4 main constructs described in section II. The data obtained is analyzed to understand factors that influence an individual’s ability to work, how their state of mind was affected by new norms, and also their general experience in a virtual setting. Using t-test, the proposed hypotheses are validated for different behavioral aspects showcased by respondents. Finally, predictive modelling using 6 supervised learning models is performed to predict an individual’s preferred method of working as either ‘remote’, or ‘in-person’. In this work, section II discusses the Self-Efficacy Theory and other relevant research undertakings. Section III discusses the methods involved for questionnaire preparation. Section IV comprises the exploratory data analysis of the survey results. Section V constitutes the hypotheses proposed by the authors regarding the behavioral experiences of those working remote. Section VI summarizes the results obtained in predictive modelling stage. Section VII concludes the work.

The contributions through this work are, firstly, formulating and testing hypotheses the results of which, can be used to potentially increase the quality of work and level of satisfaction of employees working remotely. Secondly, the usage of predictive

21 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/statistical-hypothesization-and-predictive-modeling-of-reactions-to-covid-19-induced-remote-work/314321](http://www.igi-global.com/chapter/statistical-hypothesization-and-predictive-modeling-of-reactions-to-covid-19-induced-remote-work/314321)

## Related Content

---

### Efficient Traffic Sign Recognition Using CLAHE-Based Image Enhancement and ResNet CNN Architectures

Utkarsh Dubey and Rahul Kumar Chaurasiya (2021). *International Journal of Cognitive Informatics and Natural Intelligence* (pp. 1-19).

[www.irma-international.org/article/efficient-traffic-sign-recognition-using-clahe-based-image-enhancement-and-resnet-cnn-architectures/295811](http://www.irma-international.org/article/efficient-traffic-sign-recognition-using-clahe-based-image-enhancement-and-resnet-cnn-architectures/295811)

### Policy Communication Through Artificial Intelligence in China and Western Countries: General Situations, Topics, and Prospects

Yuyun Zhang (2022). *International Journal of Cognitive Informatics and Natural Intelligence* (pp. 1-22).

[www.irma-international.org/article/policy-communication-through-artificial-intelligence-in-china-and-western-countries/307154](http://www.irma-international.org/article/policy-communication-through-artificial-intelligence-in-china-and-western-countries/307154)

### Qualitative and Cognitive Analysis and Modeling Tool for Biological Data

Hironori Hiraishi (2019). *International Journal of Cognitive Informatics and Natural Intelligence* (pp. 30-47).

[www.irma-international.org/article/qualitative-and-cognitive-analysis-and-modeling-tool-for-biological-data/226938](http://www.irma-international.org/article/qualitative-and-cognitive-analysis-and-modeling-tool-for-biological-data/226938)

### Testing the Behaviour of Entities in a Cognitive Language

Alberto dela Encina, Mercedes Hidalgo-Herrero, Pablo Rabanal, Ismael Rodriguez and Fernando Rubio (2008). *International Journal of Cognitive Informatics and Natural Intelligence* (pp. 29-43).

[www.irma-international.org/article/testing-behaviour-entities-cognitive-language/1552](http://www.irma-international.org/article/testing-behaviour-entities-cognitive-language/1552)

### Formal RTPA Models for a Set of Meta-Cognitive Processes of the Brain

Yingxu Wang (2008). *International Journal of Cognitive Informatics and Natural Intelligence* (pp. 15-28).

[www.irma-international.org/article/formal-rtpa-models-set-meta/1572](http://www.irma-international.org/article/formal-rtpa-models-set-meta/1572)