NexTech Experts Panel I

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)

NexTech 2021

CYBER 2021

October 3-7, 2021

Barcelona, Spain

CYBER 2021

Introduction to Panel 1

NexTech Experts Panel I

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)

NexTech 2021

Some of the Thematics to be discussed:

- Cyber meta-reality, biome, and microbiome.
- How the cyber meta-reality changes not only individual perceptions and management of data, but also the ecosystem at-large.

- How the COVID-19 pandemic has impacted digital interactions at work and play.
- Integrating Wellness into the digital interactions at work and play.
- Guides for management of Wellness as pertains to the digital interactions at work and play.

- Digital Interactions and Cyber are often examined from a technical vantage point as to Cyber Resilience, etc.
- However, given the Human-in-the-Loop (in addition to the Machine-in-the-Loop), it might be prudent to examine Cyber from a Human Resiliency vantage point as well.
- After all, Systems Resilience refers to both vantage points (Machine-in-the-Loop & Human-in-the-Loop). Consequently, the appropriate data should be appropriately collected and emphatically processed for the human-machine ecosystem.

NexTech Experts Panel I

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)

NexTech 2021

- The role of Artificial Intelligence (AI) and digital interactions.
- Placing limits on the use of AI in the workplace and at play (e.g., hyper-targeted advertising, emotion recognition, etc.) and exploring potential AI algorithmic biases.
- Maintaining norms of transparency and accountability in an age of ubiquitous AI.

- The paradigm of converging Veillances (e.g., Surveillance, Sousveillance, Dataveillance, Uberveillance).
- The salient risks around processes when the Veillances converge.

Harmonizing the use of White box and Black box architectures to better mitigate against machine learning bias and contending with the Veillances.

- Cyber AI: rethinking protection strategies.
- Cybercrime will become a battle of AI systems.

NexTech Experts Panel I

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)

NexTech 2021

Chair

Steve Chan, Decision Engineering Analysis Laboratory, USA schan@dengineering.org

Panelists

Sandjai Bhulai, Vrije Universiteit Amsterdam, The Netherlands s.bhulai@vu.nl
Ah Choo Koo, Multimedia University, Malaysia ackoo@mmu.edu.my
Christine Perakslis, Arizona State University, USA cperaksl@asu.edu
Joshua Sipper, Air Force Cyber College, USA jasipper@gmail.com
Les Sztandera, Thomas Jefferson University, USA les.sztandera@jefferson.edu

NexTech Experts Panel I

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)

NexTech 2021

CYBER 2020

Chair

Steve Chan

Decision Engineering Analysis Laboratory, USA

CYBER 2021

An Introduction of the Panelists (in alphabetical order)

CYBER 2021

Panelist

Sandjai Bhulai
Vrije Universiteit Amsterdam, The Netherlands

CYBER 2021

Panelist
Ah Choo Koo

Multimedia University, Malaysia

NexTech Experts Panel I

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)

NexTech 2021

CYBER 2021

Panelist

Christine Perakslis

Arizona State University, USA

CYBER 2021

Panelist
Joshua Sipper

Air Force Cyber College, USA

CYBER 2021

Panelist
Les Sztandera

Thomas Jefferson University, USA

CYBER 2021

Introduction to the Research Interests/ Positions of the Panelists (ordered by the flow of the Thematics previously introduced)

NexTech Experts Panel I
Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?
(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)
NexTech 2021

Panellist Position

Data in the Cyber Meta-reality, Biome, and Microbiome: The Complex New World

Josh Sipper, Air Force Cyber College, USA jasipper@gmail.com

- Understanding what this new world is
- Defining and managing data in this context
- Analyzing the meta-reality multidisciplinarily
- Evaluating how data exists and flows in an infinitely expanding data space

→ Many humans are or already have moved into this infinite data space

→ Every human is affected by and tied to the cyber meta-reality, biome, and microbiome

→ This changes not only individual perceptions and management of data, but the fundamental state in which humans exist

Panellist Position

Integrating Wellness in Digital Interaction: Case Studies on Digital Talents and Youth Gamers

Koo Ah-Choo (ackoo@mmu.edu.my), Tan Choon-Hong, Alexius Cheang Weng-Onn , Hawa Rahmat, Siew Wei-Fern and Elyna Amir Sharji. Multimedia University (MMU) & International Medical University (IMU), Malaysia.

- Digital interaction for health and wellness
- Domains of eHealth
- Digital talents & youth gamers
- Work from home
- Digital games

→ Digital interactions for work, play and socialize have been heavily affecting the lives of digital talents and youth gamers during COVID-19 pandemic

→ Integrating wellness concept in digital interaction is a crucial move for heavy user groups

→ Theory of acceptance and health belief model for adopting eHealth during COVID-19 pandemic

→ Some guides for better management of Work or Play From Home through self-control, moderation in using, and collective wellness.

Panellist Position

Harnessing Data for the Benefit of Society

Prof. Les Sztandera, PhD, Thomas Jefferson University, USA, Les.Sztandera@Jefferson.edu

- harnessing data for the benefits of society
- maintaining norms of transparency and accountability in an age of ubiquitous AI
- addressing the problem of AI driven unemployment and inequality
- exploring potential AI algorithmic biases
- placing limits on the use of AI: technologies such as workplace surveillance, social robotics, hyper-targeted advertising, facial recognition cameras, and emotion-reading technology

Deployment of predictive models involves ranking data and information, evaluating their "novelty indexes," and using the ranks to optimize real-time decisions within applications and processes impacting social and health issues. It is its predictive power that makes Data Analytics insights actionable. The finding associated with an action that is deemed reliable and ethical, based upon past data, gives the decision maker a high degree of confidence.

NexTech Experts Panel I

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)

NexTech 2021

Society is a facing a convergence of the veillances. What frameworks might we consider to mitigate the risks?

The Convergence of the Veillances: *Benefits & Risks*

Christine Perakslis, Arizona State University, USA cperaksl@asu.edu

- Converging Veillances
  - Surveillance
  - Sousveillance
  - Dataveillance
  - Uberveillance
- Privacy Border Crossings
- ISO 31000: Mining the Risks

→ What are the most salient risks around processes when the veillances converge?

→ What are Privacy Border Crossings to consider?

→ What are frameworks to consider to mitigate the risks?

Panellist Position

Cyber AI: rethinking protection strategies

Sandjai Bhulai, Vrije Universiteit Amsterdam, The Netherlands, s.bhulai@vu.nl

- Business Analytics
- Operations Research
- Predictive Modeling
- Machine Learning
- Artificial Intelligence

→ AI will better protect us against cybercrime

→ Cybercrime will become a battle of the AI's

CYBER 2021

Questions & Answers Session

CYBER 2021

Thank you for your efforts and the support for
a scientific cause promoted by IARIA:
affordability, accessibility, and universal free-access
to scientific knowledge for everybody.

Data in the Cyber Meta-reality, Biome, and Microbiome: The Complex New World

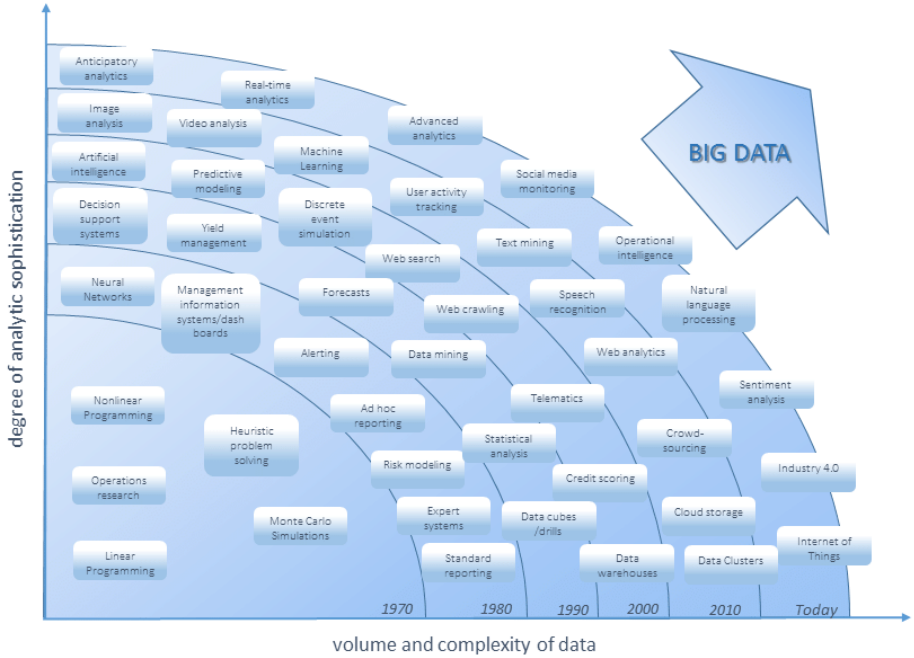
Dr. Josh Sipper
Professor of Cyberwarfare Studies
Air Force Cyber College
jasipper@gmail.com

Biographical Sketch

- Dr. Joshua Alton Sipper is currently assigned to the Air Force Cyber College as a Professor of Cyberwarfare Studies. He completed his Doctoral work at Trident University in September of 2012, earning a Ph.D. in Educational Leadership (emphasis, E-Learning Leadership). Dr. Sipper's previous degrees were obtained from Troy University (M.Ed. Education) and Faulkner University (B.S. English). Dr. Sipper is a veteran who served honorably in the U.S. Air Force in the intelligence career field and worked for Lockheed Martin in a similar capacity on the U2 program. More recently, Dr. Sipper shifted his focus into the cyber realm as a Systems Engineer for General Dynamics at the Air Force's 26th Network Operations Squadron, followed by a nine-year stint as a civil servant in the Air Force cyber career field at the Curtis E. LeMay Center for Doctrine Development and Education. Dr. Sipper currently serves as a Professor of Cyber Warfare Studies at the Air Force Cyber College, Air University, Maxwell AFB. Dr. Sipper's research interests include cyber operations, ISR, electromagnetic warfare, and cyber warfare.

Data in the Cyber Meta-reality

- Understanding what this new world is
- Defining and managing data in this context
- Analyzing the meta-reality multidisciplinarily
- Evaluating how data exists and flows in an infinitely expanding data space



→ Many humans are or already have moved into this infinite data space

→ Every human is affected by and tied to the cyber meta-reality, biome, and microbiome

→ This changes not only individual perceptions and management of data, but the fundamental state in which humans exist

Understanding the Cyber Meta-reality

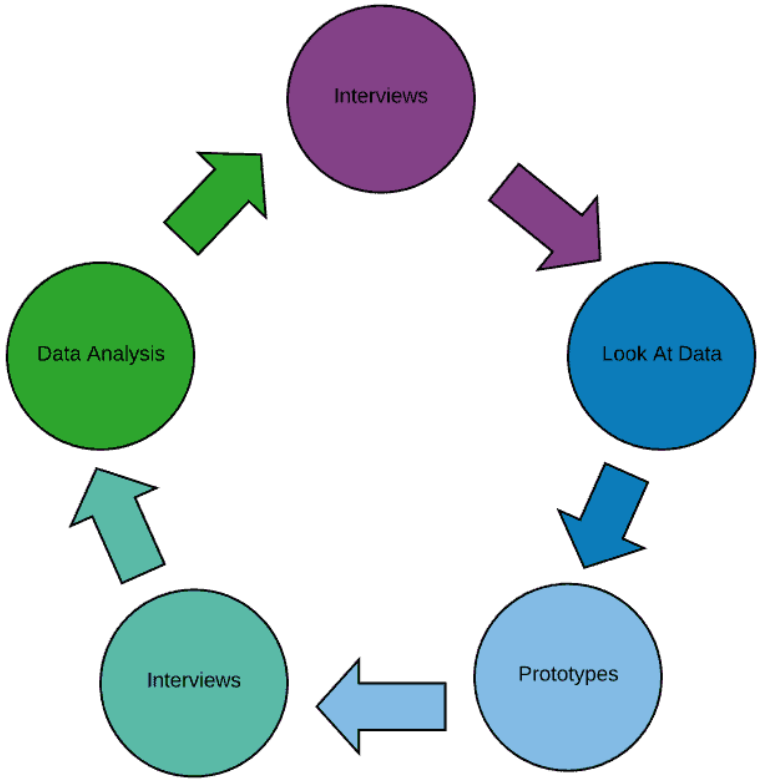
- Reality about and comprised of other realities
- Everyone creates their own reality
  - Invite others to join/participate (creates common data)
  - Realities collide (creates disparate data)
  - Realities shatter (produces fractals/infinite data realities)

Defining and Managing Data

- Data salience is based on context
- AI/ML can assist
- Determining data usefulness
- Data security
- Data meaning (semiotics)

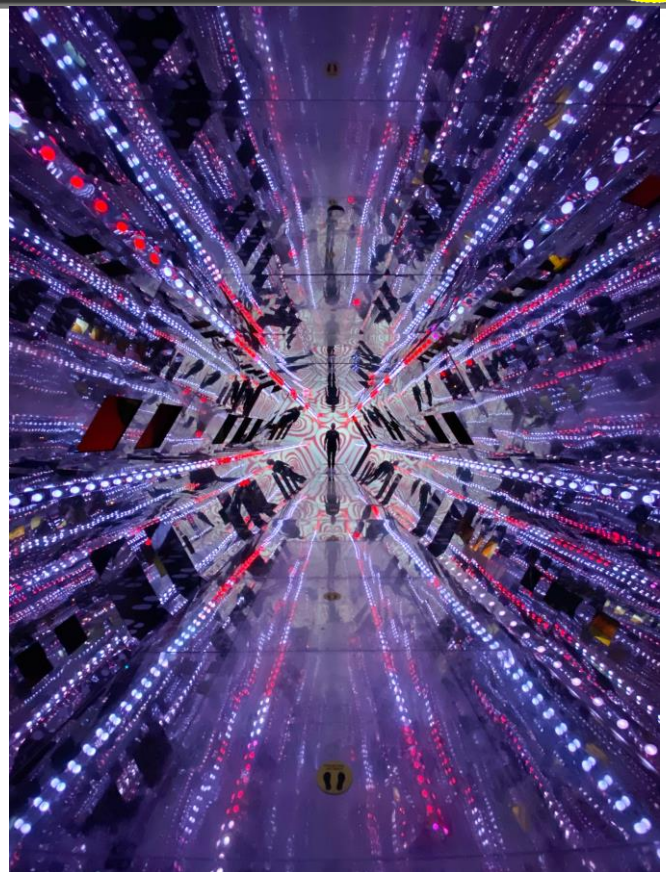
Analyzing the Meta-reality Multidisciplinarily

- Tied to semiotics
  - Metaphysics
  - Technology
  - Social
  - Cultural
  - Religious
  - Philosophy
  - Etc.
- Are we categorizing data meaningfully?



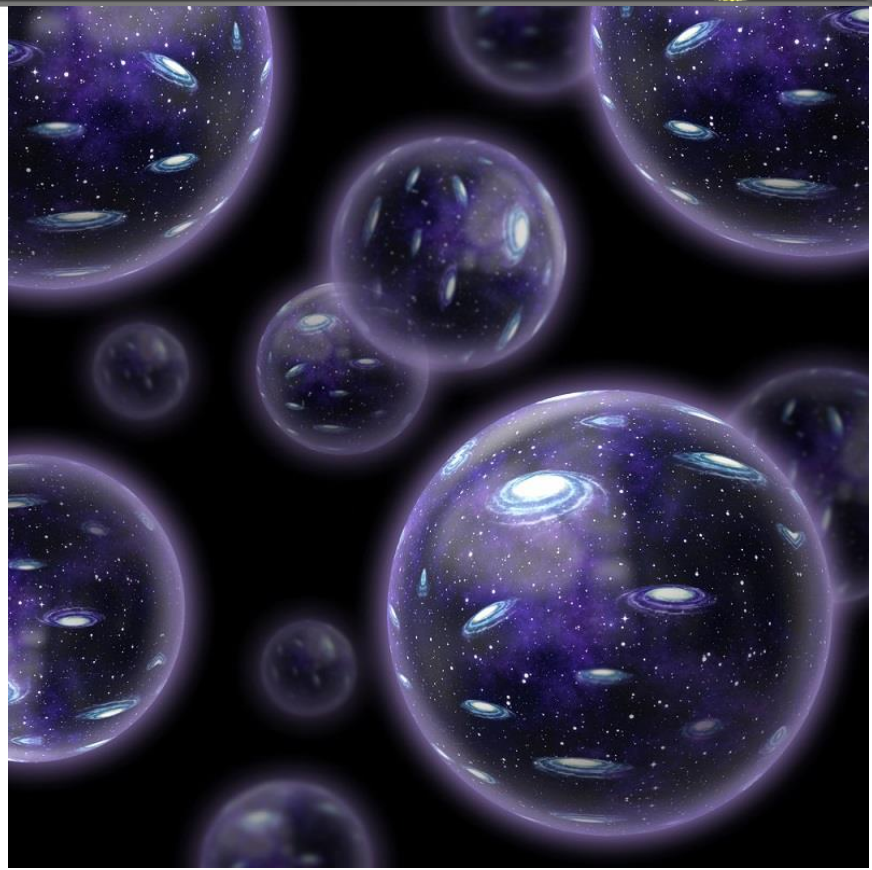
Evaluating How Data Exists and Flows

- Cyber meta-reality, like the physical universe is expanding exponentially
- Data, unlike matter and energy in the universe, is being created constantly
- Data also creates new realities and ripples in those realities



Conclusion

- Understanding the data/information environment is critical
- Context is key
- Multiple disciplines, cultures, values, and societies
- Infinite data space expanding with no sign of stopping (expanding multiverse)



Integrating Wellness in Digital Interaction:

Case Studies on Digital Talents and Youth Gamers

Presenter

Koo Ah-Choo (ackoo@mmu.edu.my)

Authors: Koo A. C*. Tan C. H*., Cheang A. W. O., Hawa R.*, Siew, W. F.** & Elyna A. S*.**

***Multimedia University (MMU) & **International Medical University (IMU), Malaysia.**

This research is supported by the Malaysia Ministry of Higher Education's

Fundamental Research Grant Scheme (FRGS) [FRGS/1/2019/SS09/MMU/02/3]

Panellist Position

Integrating Wellness in Digital Interaction: Case Studies on Digital Talents and Youth Gamers

Koo Ah-Choo (ackoo@mmu.edu.my), Tan Choon-Hong, Alexius Cheang Weng-Onn , Hawa Rahmat, Siew Wei-Fern and Elyna Amir Sharji. Multimedia University (MMU) & International Medical University (IMU), Malaysia.

- **Digital interaction for health and wellness**
- **Domains of eHealth**
- **Digital talents & youth gamers**
- **Work from home**
- **Digital games**

→ Digital interactions for work, play and socialize have been heavily affecting the lives of digital talents and youth gamers during COVID-19 pandemic

→ Integrating wellness concept in digital interaction is a crucial move for heavy user groups

→ Theory of acceptance and health belief model for adopting eHealth during COVID-19 pandemic

→ Some guides for better management of Work or Play From Home through self-management, moderation in usages, and collective wellness.

- Dr Koo Ah-Choo is an Associate Professor at Faculty of Creative Multimedia (FCM), Multimedia University (MMU). She received her B.Sc. (Hons) from the Technology University of Malaysia (UTM) and her PhD from Multimedia University (MMU).
- Her research specialization is mainly on technology enhanced learning and quality of life. She is active in the research of media usage, design and creation, media methods especially in the promotion of education, wellness, communication, collaboration and lifelong learning.
- She is currently served as the Deputy Director for Industrial Collaborations and Engagement Centre (ICEC), under the Office of Research, Industrial Collaboration and Engagement (RICE) at Multimedia University.

Research Interest & Workgroup

- **Research Interest**: Interactive multimedia, media contents & usage; creation & methods especially in the promotion of education, communication, collaboration and life-long learning.
- **Research Centre:** Currently she is a member of Research Centre for Interactive Media in the Faculty of Creative Multimedia (url: creative.mmu.edu.my).
- She is currently the project leader for a *Fundamental Research Grant Scheme* (FRGS) by the *Ministry of Higher Education*, entitled, "*eHealth Modality for Mental Wellness among Digital Talents*". She also involved in research and creative projects funded by various agencies:- 1) *Affective Roles of Ubiquitous Learning in a 'Patient Centred Health Care Model'* for Malaysian Hospitals; 2) ProbMobile: An interactive mobile learning framework for Probability; 3) UNHCR's Health Media Production project; 4) Digital Future Research Programme; 5) Designing Mobile Services for Ageing Women in Malaysia. Website: https://mmuexpert.mmu.edu.my/ackoo & google scholar.

Images taken from FCM's website

Position of the current research:

>> Background & Issue

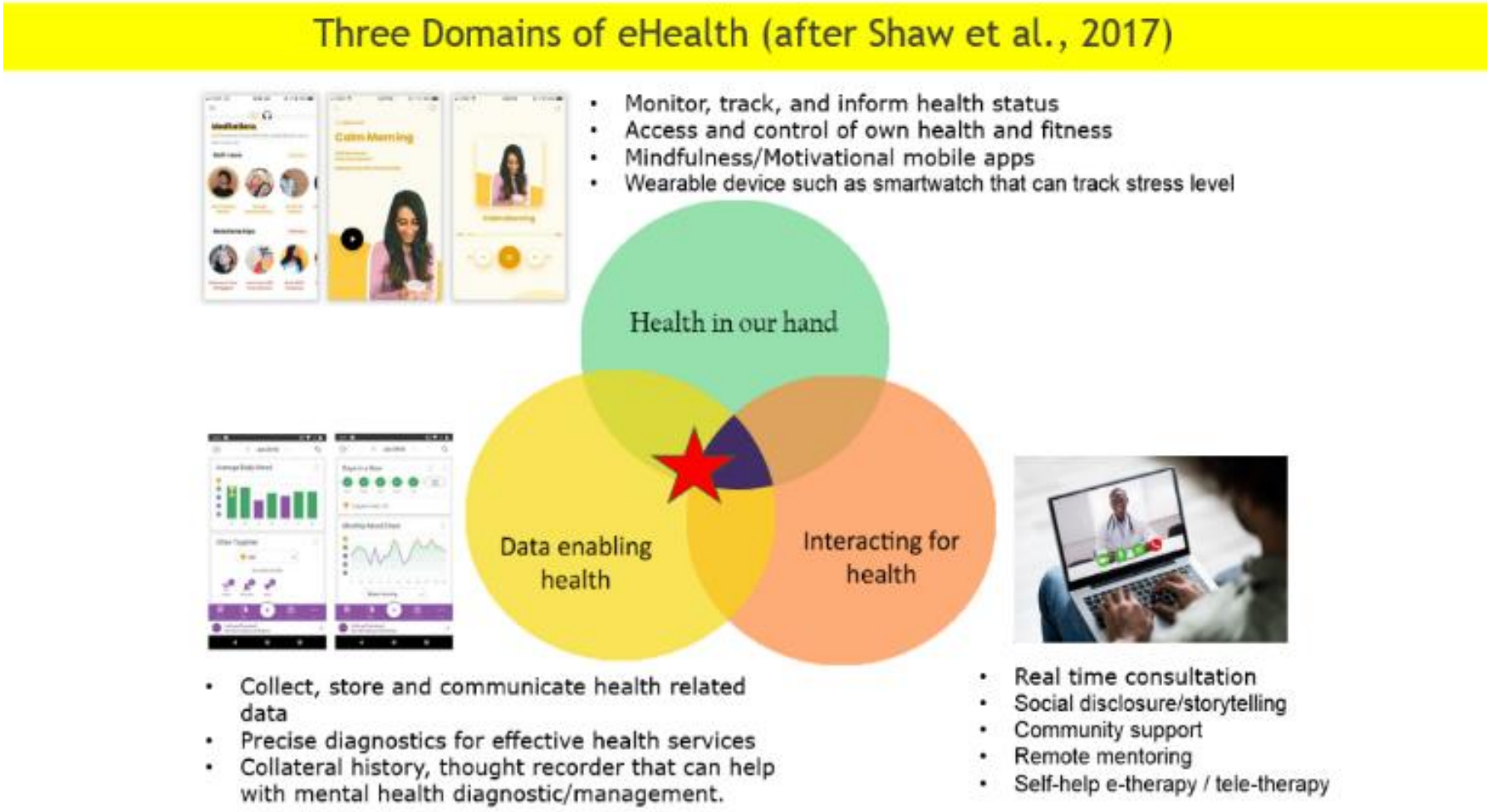
- Pandemic issue affecting health, wellness, work and study.
- Health = **"The ability to adapt and self-managed in the face of social, physical, and emotional challenges**" (Huber, et at., 2011)
- Wellness = **"An active process where people become aware of, and make choice toward, a more successful existence"** (National Wellness Institute, 2013);
  - It is multi-dimensional that include our lifestyle, mental health or mental wellness and spiritual well-being (Stoewen, 2015).
- Covid-19 pandemic, movement control order and restriction – workers and students are all working / Interacting from home (WFH) through digital means.

Digital Interaction for health, work & play – has become an **emerging topic** for research.

Digital Interaction for Health (eHealth / digital health)

>> Interaction for Health

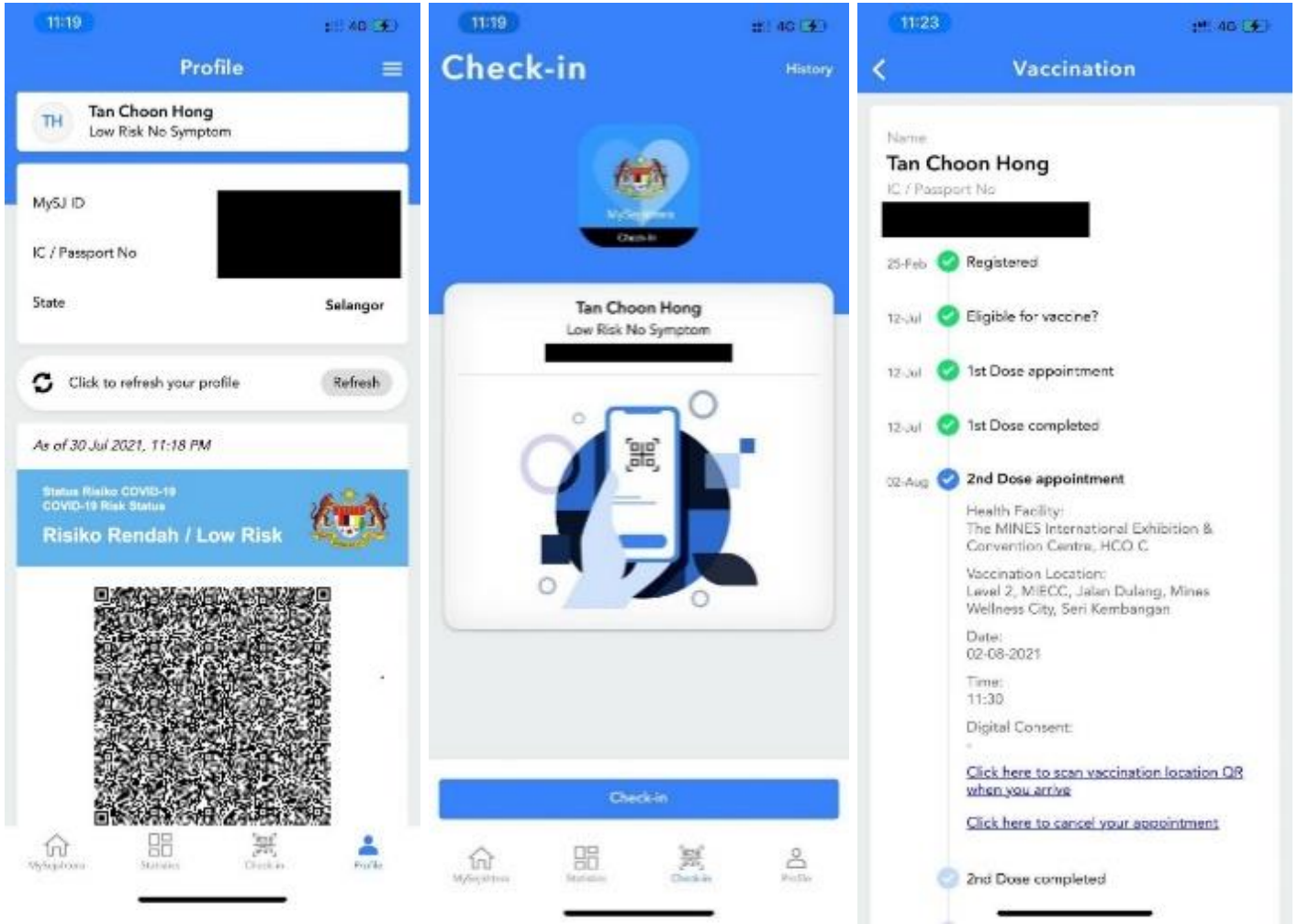
One of the three domains of eHealth by Shaw et al. (2017).



Digital Interaction for Health

>> Interaction for Health

Malaysia Covid-19 Application, MySejahtera



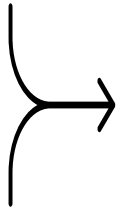
The app helps users in **contact tracing**, manage and review their health, assist in **vaccination management** and certification, provide **accurate information**, and **locate nearest** hospitals and clinics.

24.5 million users with up to 30,000 daily downloads despite misconceptions on the app (Malay Mail, Dec 2020)

>>Explaining eHealth adoption

1) UTAUT (Unified Theory of Acceptance and Use of Technology)

- ***<u>Beliefs about CAPABILITY</u>***
    - ***Perceived usefulness (performance expectancy); perceived ease of use (effort expectancy)***
- ***Social influence***
    - *degree of which important the important others believe one should use or not use.*
- ***Facilitating conditions*** *with support from organizations and their infrastructure*
    - ***Environmental context and resources***



Influence on the behavior to adopt eHealth

<u>2) Beliefs on the CONSEQUENCES</u> ->Health Belief Model

- ***Perceived vulnerability to a negative health condition; perceived severity / hazards; perceived advantages and perceived barriers.***

Ref:
H. Sari, M. Othman, and A. M. Al-Ghaili (2019); T. Koivumäki (2017); Cane, J., O'Connor, D., & Michie, S. (2012).

Methodology: [Scoping] Review

- Two user groups / case study
  - **1) Digital Talents (DT)**
  - **2) Youth Gamers (YG)**

- Scoped reviews existing documents reported in **the literature which include media reports** to explore how these two groups experience digital interactions during Work / Study from Home settings.

**For DT group, keywords used for searching the reports were digital talents, digital industry, or digital workers.

**For the second user group, the keyword searched were gamers, youth, young gamers.

+ All these keywords were concurrently searched with the main keywords, i.e., COVID-19 or pandemic, work, or study from home.

- The articles were reviewed by extracting the survey findings and key observations.

*Digital Interaction for **Work***

>> Case Study 1, Digital Talents (DT)

RQ: To what extent do DT perform their work-life balance while working from home?

High demand on DT in digital industry; they are the ‘frontliners’ in Digital Industry

- Technical skills
- Soft skills

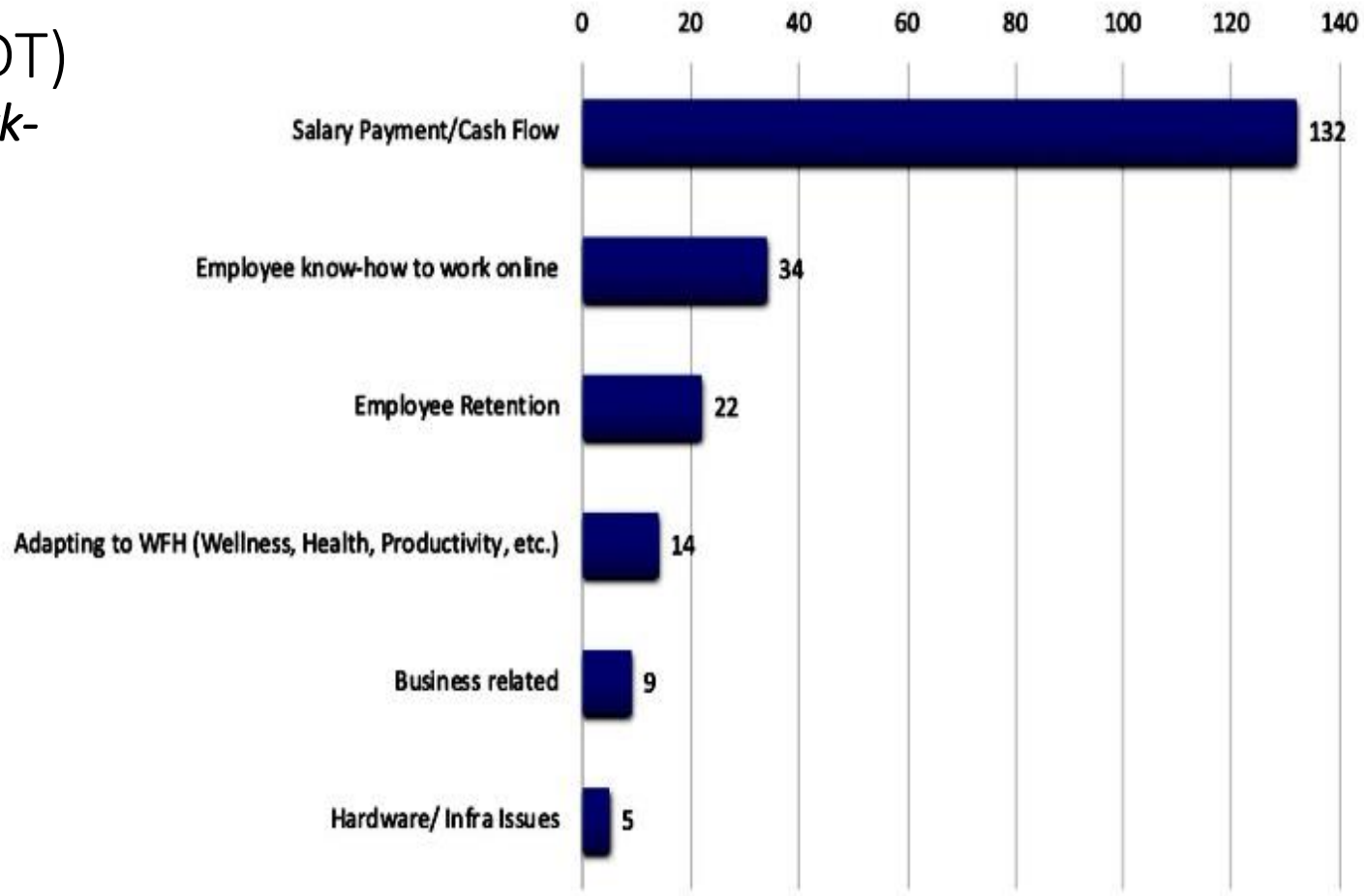
Digital Interaction for ***Work***

>> Case Study 1, Digital Talents (DT)

RQ: To what extent do DT perform their work-life balance while working from home?

- WFH – flexible
- MDEC study (2020) on Companies (mainly from digital industry) concern more on:-
  - Salary payment / cash flow ($).
  - How to work online from home / WFH; with the elements of wellness, health and productivity too.
- At global level:
  - 55% workers prefer combination of f2f and remote / virtual working

  (ref: PwC, 2020, 2021)



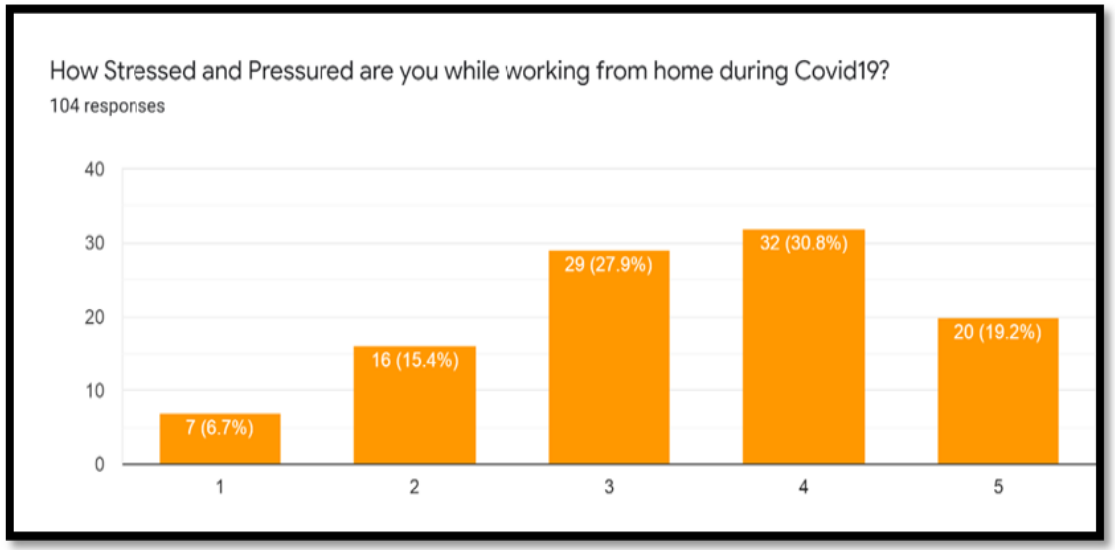
Others

- Fewer new sales generation
- No client contract renewal
- Projects paused
- Pipelines pushed
- Maintaining customers
- Employee missing in action

*Digital Interaction for **Work***

>> Case Study 1, Digital Talents (DT)

RQ: To what extent do DT perform their work-life balance while working from home?



Study by Marimuthu and Vasudevan (2020): How stressed and pressured while WFH? (early locked down period in April 2020)

Imbalance hours of Working & Home; unclear boundary between the two environments; unable to disconnect; "**always-on**"

Overwork (PwC, 2021): Only 28% of employees can detach from work outside of working hours; Only 22% says they are encouraged to take brief breaks during workdays; 25% believes their boss helps them manage stress and focus on mental and emotional well-being.

Burnout & Pandemic Burnout – being exhausted, cynical and discouraged – workplace burnout is due to relationship with the workplace (Leiter, and J. Wintle, 2021).

Strategies for **health promoting WFH** should be prioritized.

*Digital Interaction for **Play***
>> Case Study 2, Youth Gamers (YG)

To what extent do YG perform their work-life balance while studying from home?

- **Balance** between study and play.
- Parents believe gaming during lockdown is the **primary method of socializing with friends** (13 - 18 years old) (Eandt.theiet.org, 2021)
- Barr and Capeland-Steward (2021) conducted an online survey (N = 781), with 16 years of age and older.
  - They found that **71% of respondents had increased the amount of time spent playing games**, while **58% of respondents reported that playing games had positively impacted their well-being** by providing **cognitive stimulation** and opportunities to **socialize**, along with reducing anxiety and stress, escape (pandemic stress) into an alternate reality

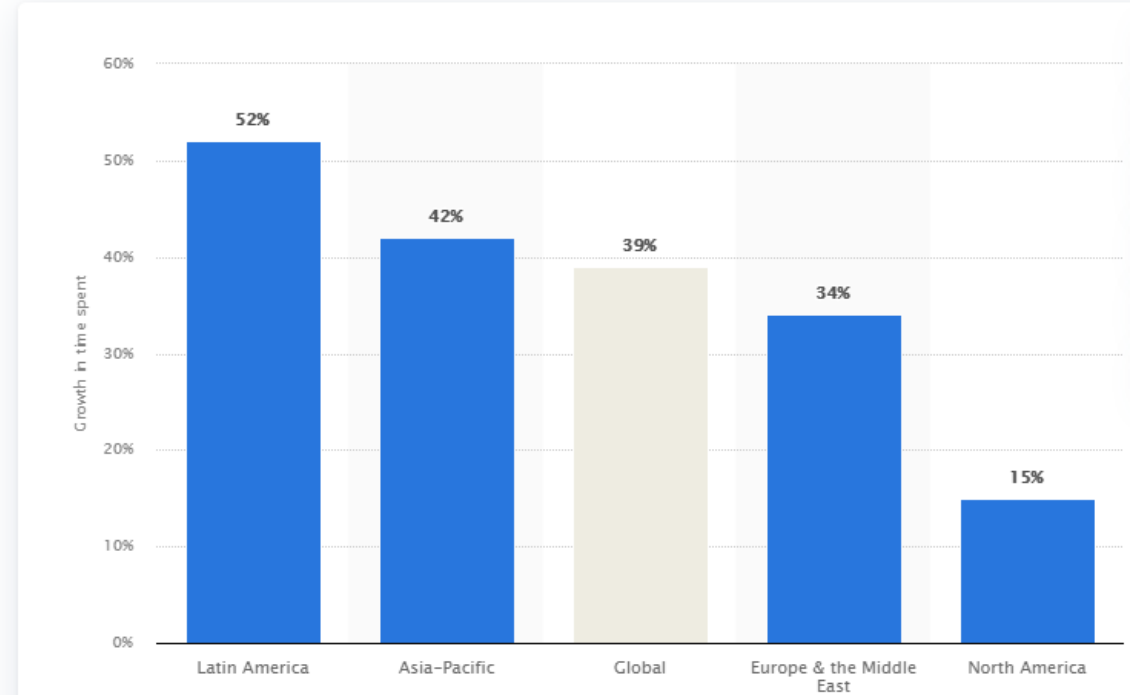
>> Case Study 2, Youth Gamers (YG)

To what extent do YG perform their work-life balance while studying from home?

- The **rise of online gaming** during locked down
  - Time spent on video gaming as a form of entertainment by 39% globally.
- The case of **Roblox game**

The first quarter or 2021- is one of the highest played games in the world due to pandemic. On average 42.1 mil daily active users of Roblox games worldwide. Clement, 2021)

Increase in time spent video gaming during the COVID-19 pandemic worldwide as of June 2020, by region:



(Clement, 2020 from Statisca.com)

*Digital Interaction for **Play***

>> Case Study 2, Youth Gamers (YG)

To what extent do YG perform their work-life balance while studying from home?

- **Is Internet gaming interaction influence on addiction or wellness?**

  <u>Addiction:</u>

  WHO (2018) has included gaming disorder in the 11th Revision of the International Classification of Diseases (ICD).

  - Criteria: Sufficient severity to result in significant **impairment in personal, family, social, educational, occupational** or other important areas of functioning. & would have been evident for **at least 12 months** (WHO, 2018)
  - Some countries like South Korea and China has been recognized it as a disorder – with treatment programme.

  <u>Insufficient Evidence</u> of Addiction:

  - American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disordered (DSM-5) took the position that there was **insufficient evidence** to determine if internet gaming is a disorder but did recommend further research (Starcevic, 2017).

Digital Interaction for ***Play***

>> Case Study 2, Youth Gamers (YG)

To what extent do YG perform their work-life balance while studying from home?

Advantages of online games (explanation from psychology viewpoint)

- **Flow** (improve mood & anxiety, cognitive stimulation – can combat boredom) (Csikszentmihalyi, 1991)
- **Agency** (to be able to control – while playing relaxing type of game, can de-stress)
- **Normalization and socialization** – to keep in touch with others

Influence on [Academic] Performance

- A study in China, found that students who spent more than an hour each day on these activities during the school week scored **significantly lower grades** (M. Gideon, 2021)
  - This finding suggests that incorporating **time limits on youth's usage of interactive technology** is necessary to maintain a **balance** between online and offline worlds, such as on their studies or learning activities.

Photo by Samuel Regan-Asante on Unsplash

Discussions & Conclusion:

>>Integrating wellness into digital interactions

- For DT users
  - Integration of **wellness** in the virtual and physical workplace (should be prioritized)
  - Reminder of the principle of **Balance** – work and personal life
  - How:- stress on "**Collective Well-being**" – promote positive mindset, EQ and improved communications.
- For YG users
  - Awareness of the principle of **moderation** in spending time on online games
  - Guides for online games (privacy, safety, respect etc)

Future Work

Increase of **opportunities (and challenges) of eHealth Interaction** Research

- Acceptance and use of eHealth Interaction
- Various eHealth application, methods and services
- Advanced technologies

Specific research on DT and YG on **their experiences while working or studying at home**.

- Issue and challenges faced by them;
- Factors that motivate or deter them from using certain technology or applied methods for the well-being.

[Virtual E-BeeRUN by MMU]

https://www.mmu.edu.my/ebeerun/

References

C. Knorr, “Is Roblox safe for kids? How does it work? And what the heck are Robux?”, Common Sense Media, 2021. [Online] https://www.commonsensemedia.org/blog/parents-ultimate-guide-to-roblox [retrieved: March, 2021]

D. L. Stoewen, “Health and Wellness”, Can Vet J., 56(9), pp. 983–984, 2015. https://doi.org/10.1177/097206340400600213

Eandt.theiet.org, "Young people use video games as vital social tool in lockdown", Eandt.theiet.org, 2021. [Online] https://eandt.theiet.org/content/articles/2021/02/young-people-use-video-games-as-vital-social-tool-in-lockdown-study-shows/ [retrieved: Aug, 2021]

Harvard Business Review (Winter Special Issue), “The new work / life balance”, 2020.

J. Clement, “Daily active users (DAU) of Roblox games worldwide from 4th quarter 2018 to 1st quarter 2021”, 2021. [Online] https://www.statista.com/statistics/1192573/daily-active-users-global-roblox/ [retrieved: March, 2021]

J. Clement, “Increase in time spent video gaming during the COVID-19 pandemic worldwide as of June 2020, by region”. [Online] https://www.statista.com/statistics/1188545/gaming-time-spent-covid/ [retrieved: July, 2021]

M. Barr, and A. Copeland-Stewart, “Playing Video Games During the COVID-19 Pandemic and Effects on Players’ Well-Being”, Games and Culture, Vol. 0(0), pp. 1–18. https://doi.org/10.1177/15554120211017036, 2021.

M. Csikszentmihalyi, “Flow: The psychology of optimal experience”, New York: HarperPerennial, 1991.

M. Gideon, "Survey Shows Majority Of Children Want Gaming In Schools", Business of Esports, 2021. [Online].

M. Huber, J. A. Knottnerus, L. Green , H. v. d. Horst , A. R. Jadad, and D. Kromhout et al., “How should we define health?”, BMJ, 2011; 343 :d4163 doi:10.1136/bmj.d4163

Malaysian Digital Economic Corporation, MDEC). Digital talent report 2017. Cyberjaya. Published by Frost & Sullivan, 2017.

MDEC, “Digital Workforce Covid Impact Survey 2020: Digital Talent Development”, 2020. [Online] https://mdec.my/wp-content/uploads/Digital-Workforce-Covid-Talent-Impact-Survey-2020.pdf [retrieved: June, 2021]

MMU, “Virtual MMU eBeeRUN 2020”, [Online] https://www.mmu.edu.my/ebeerun/ [retrieved: June, 2021]

National Wellness Institute, “About Wellness”, 2015. [Online] http://www. nationalwellness.org/?page=AboutWellness [retrieved: July, 2021]C. H. Tan, A. C. Koo, H. Rahmat, W. F. Siew, A. C. O. Chiang, and E. Amir Sarji, “Exploring eHealth model and its acceptance for mental wellness among digital talents”, Digital Futures International Congress (Difcon), 21-23 June 2021.Malaysia Government, Mysejahtera.malaysia.gov.my MySejahtera, [Online] https://mysejahtera.malaysia.gov.my/intro/ [retrieved: July, 2021]PwC Australia, “The future of work, Thinking beyond: How the pandemic is rewiring a new world of work”, p. 8, 2020.

O. MOK, “Health ministry source: MySejahtera covers 24.5 million users with up to 30,000 daily downloads despite misconceptions,” Malay Mail, Dec. 04, 2020.

P. Marimuthu, and H. Vasudevan, “The psychological impact of working from home during Coronavirus (Covid-19) pandemic: A case study”, CnR’s International Journal of Social & Scientific Research, 06 (June (1)), pp. 18–29, 2020.

PwC, “PwC’s hopes and fears survey 2021: Malaysia report”, 2021. [Online] www.pwc.com/my/newworldnewskills [retrieved: November, 2020]

T. Shaw, D. McGregor, M. Brunner, M. Keep, A. Janssen, and S. Barnet, “What is eHealth (6)? Development of a conceptual model for ehealth: Qualitative study with key informants,” J. Med. Internet Res., vol. 19, no. 10, 2017, doi: 10.2196/JMIR.8106.

V. Starcevic, “Internet gaming disorder: Inadequate diagnostic criteria wrapped in a constraining conceptual model”, Journal of behavioral addictions, 6(2), pp. 110–113. https://doi.org/10.1556/2006.6.2017.012, 2017.

WHO, “Addictive behaviours: Gaming disorder”, World Health Organization, 2018. [Online] https://www.who.int/news-room/q-a-detail/addictive-behaviours-gaming-disorder [retrieved: June, 2021]

H. Sari, M. Othman, and A. M. Al-Ghaili, “A proposed conceptual framework for mobile health technology adoption among employees at workplaces in Malaysia”, vol. 843, Springer International Publishing, 2019.

T. Koivumäki, S. Pekkarinen, M. Lappi, J. Vaïsänen, J. Juntunen, and M. Pikkarainen, “Consumer adoption of future mydata-based preventive ehealth services: An acceptance model and survey study”, J. Med. Internet Res., vol. 19, no. 12, pp. 1–15, 2017.

The Tenth International Conference on Data Analytics

DATA ANALYTICS 2021

October 03, 2021 to October 07, 2021 - Barcelona, Spain

In God we trust, all others bring secure, reliable and ethical data, especially in healthcare

Prof. Les Sztandera, PhD, Thomas Jefferson University, USA
Les.Sztandera@Jefferson.edu

Thomas Jefferson University is currently planning research pursuits associated with the National Institutes of Health (NIH) Bridge to Artificial Intelligence (AI) initiative.

Ethical and Trustworthy Artificial Intelligence (AI)/Machine Learning (ML) Bridge2AI defines the field of ethical and trustworthy Artificial Intelligence (ETAI) as the study of the influence and behavior of humans and/or AI/ML systems during the design, development, and implementation of AI/ML-ready data, tools, and technologies as well as the effects and implications of those behaviors on users and society. ETAI research encompasses the unique ethical, legal, and social implications (ELSI) of biomedical and behavioral AI/ML research in addition to principles of trustworthy AI/ML.

The technological ability to collect large volumes of multimodal data in a clinical care setting has far outpaced the ability to represent and process these data for building trustworthy AI/ML tools for clinical use. Beyond the state-of-the-art imaging employed in clinical care, new technologies for three-dimensional assessment of tissues and low-cost genomics show promise to transform our understanding of pathological basis of disease and drive development of new treatments. Data science developments have led to new approaches to create and manage large compendia that mix a wide array of data types, showing potential to transform AI/ML tool development.

Majority of the relevant representational standards were developed within the context of an individual data type blind to other clinically accessible parameters, without a systematic approach that considers multimodal integration. Moreover, that data are typically annotated for supporting clinical decision making and not for comprehensively demarcating features relevant for building unbiased AI/ML tools, limiting the scope of data models accordingly. In addition, standards need to be developed for handling data generated by emerging technologies such as 3D pathology imaging and high-resolution molecular analysis. The best practices for data models in precluding ethical pitfalls, particularly arising from unintended use and combination of data types, are as yet unclear. The data modeling and annotation practices that bring to surface the underlying bias and potential contribution to healthcare disparities are not established.

In addition, Thomas Jefferson University actively participates in conferences Organized in partnership between the Vatican's Pontifical Council for Culture, the Cura Foundation and the Science and Faith (STOQ) Foundation, including most recent 5th International Vatican Conference "Exploring The Mind, Body, and Soul", May 6-8, 2021 that brought together the world's leading AI ethicists, physicians, scientists, leaders of faith, ethicists, patient advocates, policymakers, philanthropists and influencers to engage in powerful conversations on the latest breakthroughs in medicine, health care delivery and prevention, as well as the anthropological outcomes and the cultural impact of technological advances. Together we will focus on advances in medical innovation and the creation of healthier communities and seek to catalyze new, interdisciplinary approaches and partnerships to improve health and wellbeing, as well as understand human uniqueness, all while ethically collecting data by Artificial Intelligence.

NexTech Experts Panel I

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)

NexTech 2021

NexTech Experts Panel I

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)

NexTech 2021

NexTech Experts Panel

Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?

Cyber AI: rethinking protection strategies

NexTech 2021 Panel

Barcelona, Spain, October 3-7, 2021

Sandjai Bhulai

VU VRIJE UNIVERSITEIT AMSTERDAM

Sandjai Bhulai

s.bhulai@vu.nl

Professional Experience

- Full Professor of Business Analytics
- Director of Education, VU Mathematics
- Co-founder PersonalAIze
- Co-founder Santrix

Research

- Decision making under uncertainty
- Predictive modeling
- Machine learning / AI

The rise of cybercrime

WannaCry

Ransomware Attack

- 230,000 computers affected
- 150 countries
- Total costs in the billions

The rise of cybercrime

Cost of cybercrime is rising

$11.7m → **$13.0m** **+12%** **=72%**

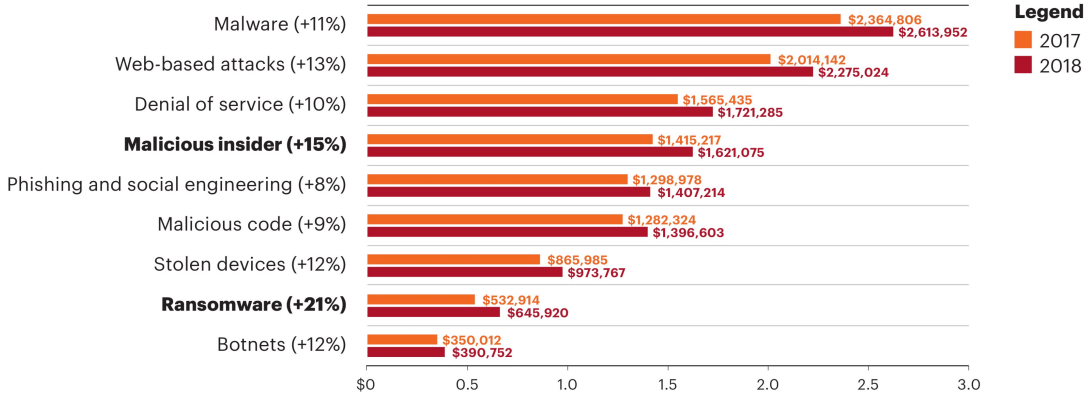
Average cost of cybercrime in 2017

Average cost of cybercrime in 2018

Increase in the last year

Increase in the last 5 years

People-based attacks have increased the most



Business consequences are expensive

$4.0m

Cost of business disruption

$5.9m

Cost of information loss

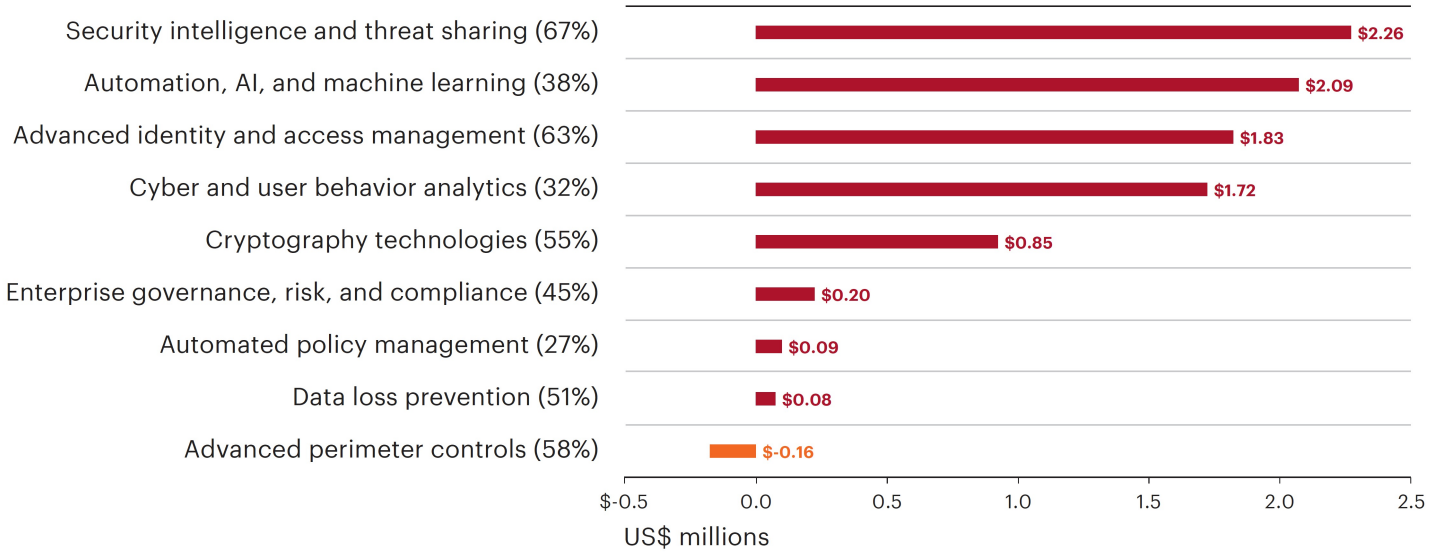
36%

Proportion of spend on discovering attacks in 2018

Emerging technologies

SECURITY TECHNOLOGIES CAN REDUCE COSTS

Net technology savings (Total technology savings minus total technology spend)



Advantages of AI

- Fast detection
- Detecting new threats
- Battling bots
- Breach risk prediction
- Can handle a lot of data
- No human errors
- Automating routing work
- Smart approach to education

Disadvantages of AI

- Use of AI by adversaries
- Cyberthreats evolve
- High adoption barrier
- AI is still expensive
- Unemployment
- It is better to be cautious - explainability

NexTech Experts Panel I
Cyber Protection: Are we Correctly Metering and Accurately Processing Salient Data?
(critical cyber systems, useless huge data, patterns in big data, data quality and cyber-relevance, obsolete or fake data, multi-facets dataset puzzle, risk analysis, process standardization, lessons learned. etc.)
NexTech 2021

Resilience is essential for a robust society, yet society is operating within multiple converging contexts of digitization likely to lead to The Age of Allostatic Load (A-Load)

Converging Contexts & The Age of Allostatic Load

Christine Perakslis, Arizona State University, USA cperaksl@asu.edu

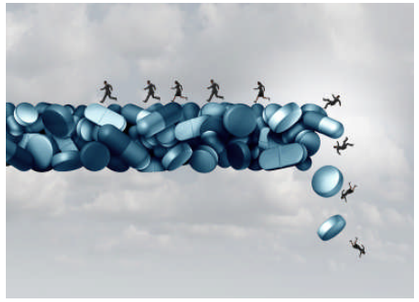
- Converging Contexts
  - Addiction by Design (Adb)
  - Convergence of Digitization
  - Societal VUCA (Volatility, Uncertainty, Complexity, and Ambiguity)
  - Covid Consequences
- The Age of Allostatic Load (A-Load)

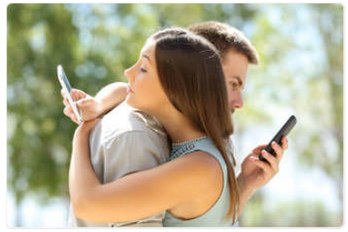
→ What happens when the world around us is teeming with products & services leading to the neurobiology of addiction?

→ What happens when there is a convergence of contexts leading to the neurobiology of stress?

→ Are we entering the Age of A-Load?

SPECIAL ACKNOWLEDGEMENTS:
Roba Abbas, University of Wollongong, NSW
Katina Michael, Arizona State University, Arizona
MG Michael, Independent Researcher, NSW
Jeremy Pitt, Imperial College, London





Societal Contexts

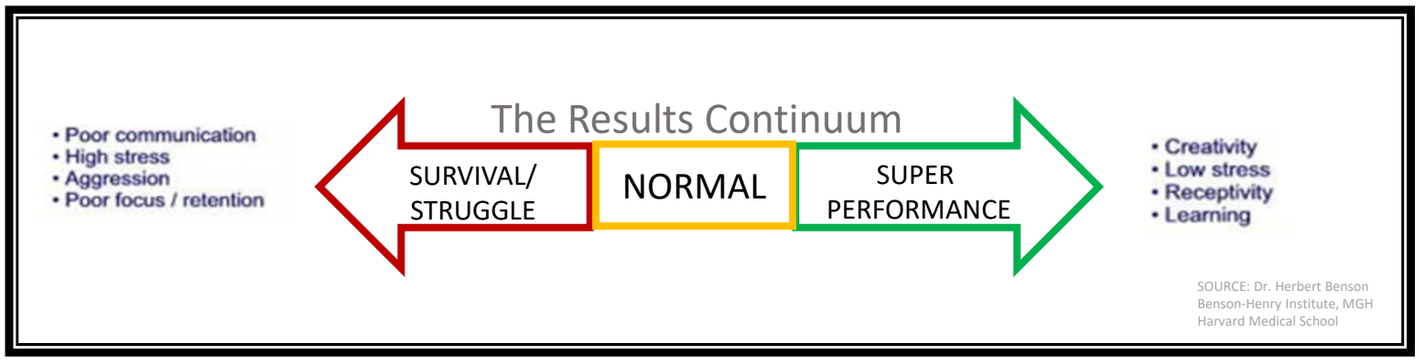
Digitization:
Converging Processes

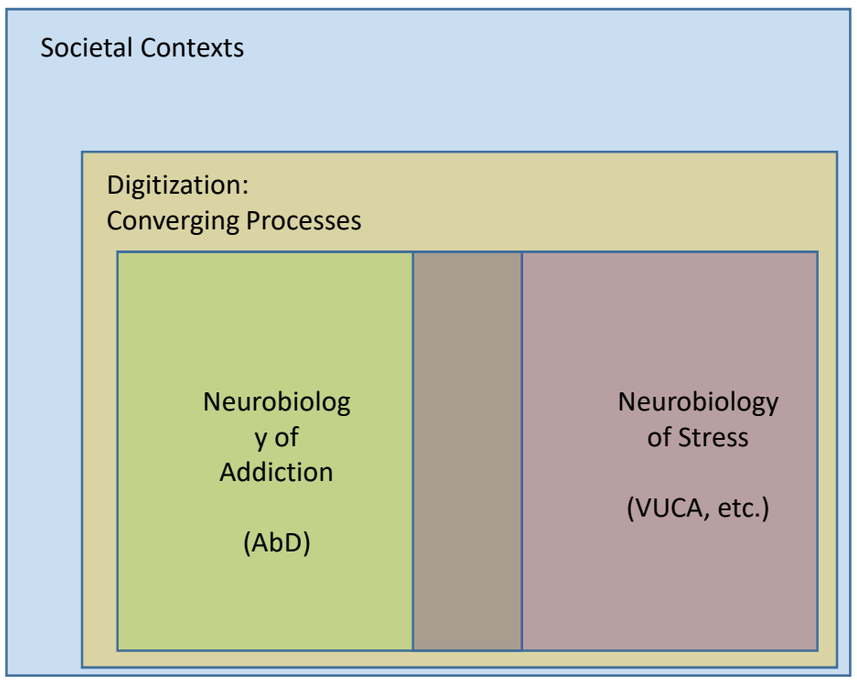
Neurobiology
of Addiction

(AbD)

Neurobiology
of Stress

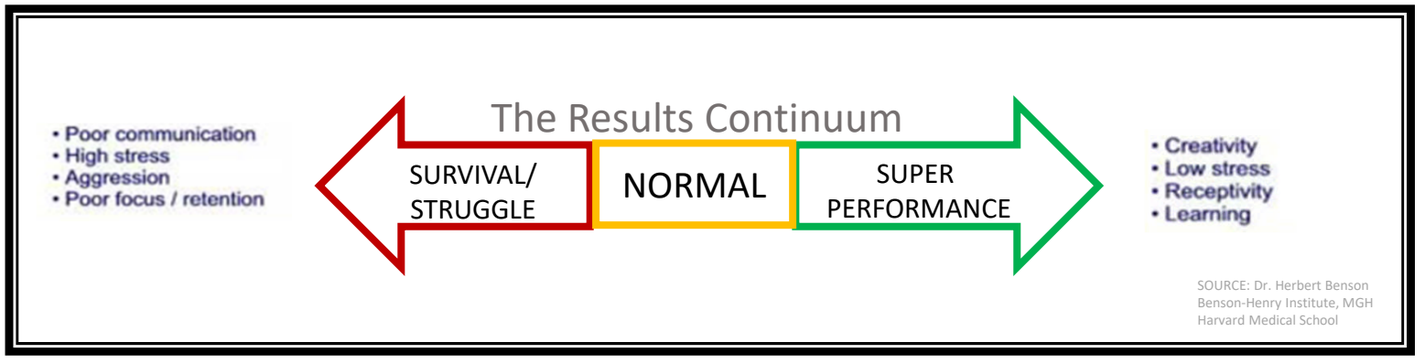
(VUCA, etc.)


The Results Continuum
• Poor communication
• High stress
• Aggression
• Poor focus / retention
SURVIVAL/ STRUGGLE
NORMAL
SUPER PERFORMANCE
• Creativity
• Low stress
• Receptivity
• Learning
SOURCE: Dr. Herbert Benson
Benson-Henry Institute, MGH
Harvard Medical School


Societal Contexts
Digitization:
Converging Processes
Neurobiology of Addiction
(AbD)
Neurobiology of Stress
(VUCA, etc.)

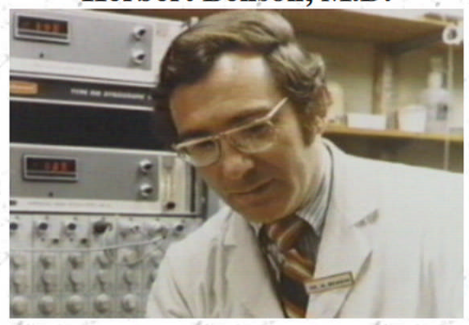
STRESS RESPONSE
Fight, Flight, Freeze

RELAXATION RESPONSE
Rest & Digest



Walter Bradford Cannon, M.D.

Herbert Benson, M.D.



A-Load

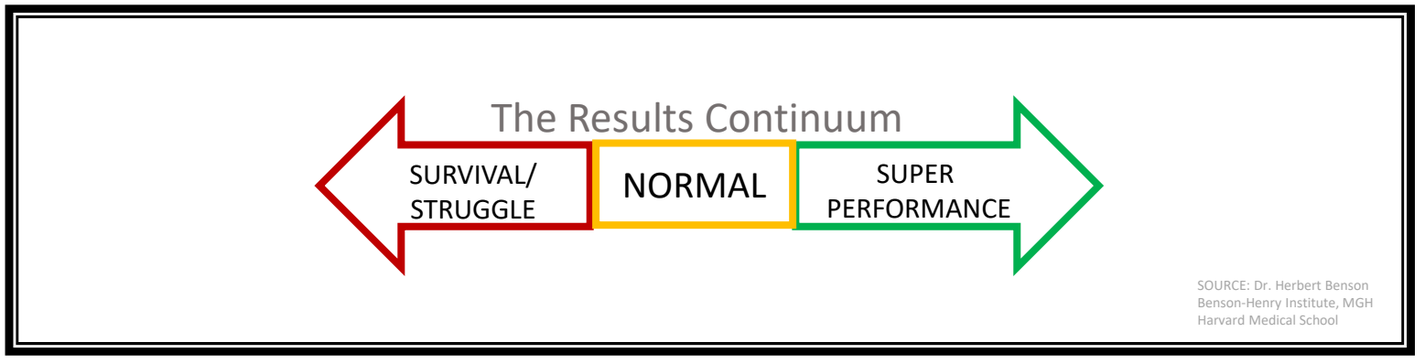
The "wear-and-tear" on the human* due to the accumulation of chronic (or repeated) stress

**dysregulation physiologically*

ALLOSTATIC LOAD

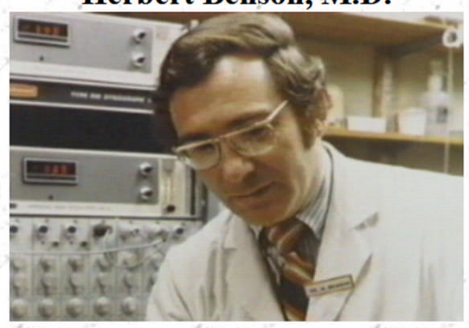
STRESS RESPONSE
Fight, Flight, Freeze

RELAXATION RESPONSE
Rest & Digest



Walter Bradford Cannon, M.D.

Herbert Benson, M.D.

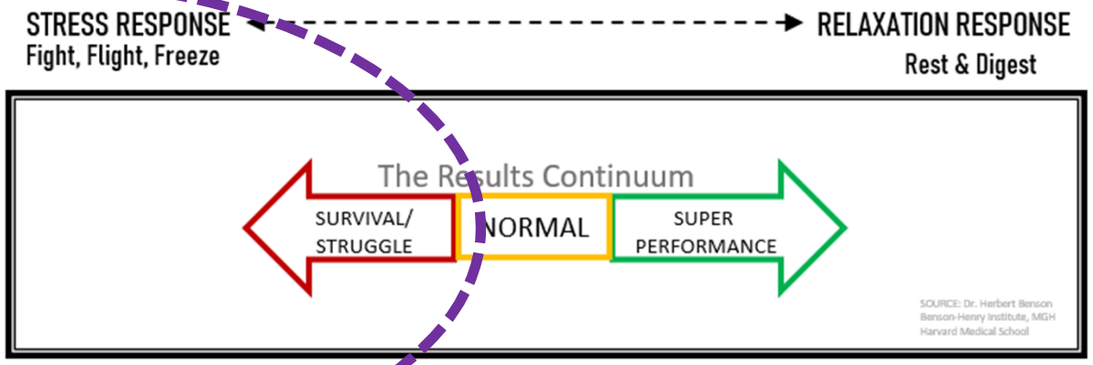


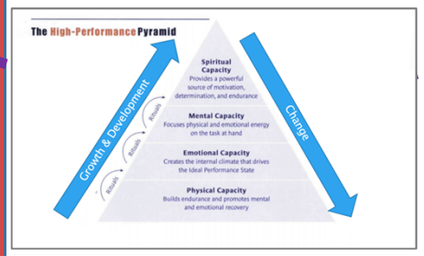
RESILIENCE

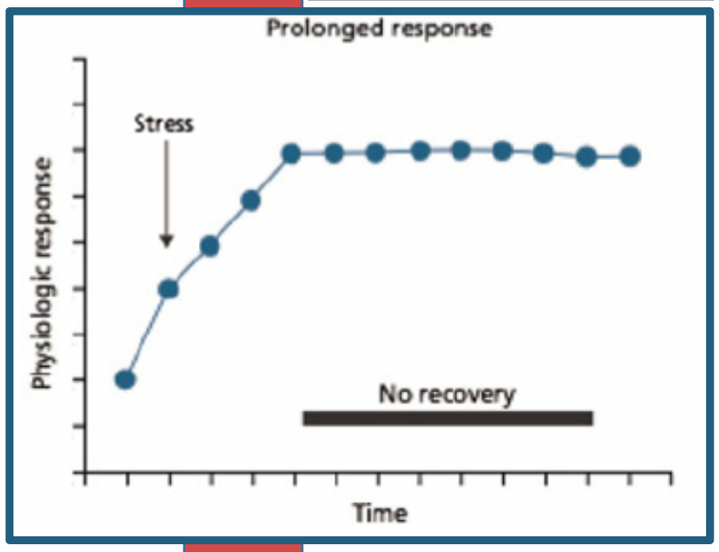
Resilience

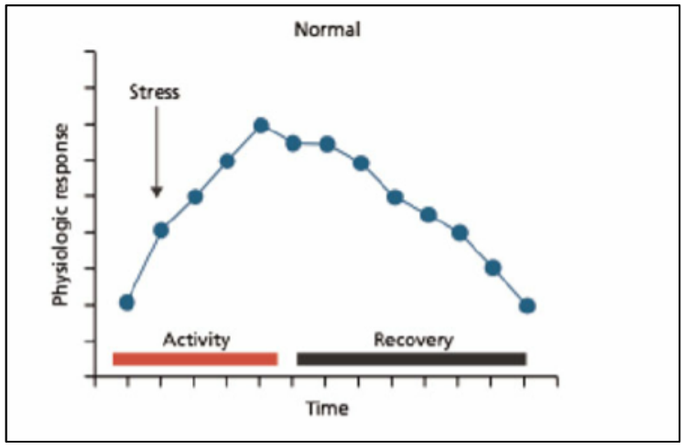
The ability to prepare for, withstand, & recover from adversity.

ALLOSTATIC LOAD







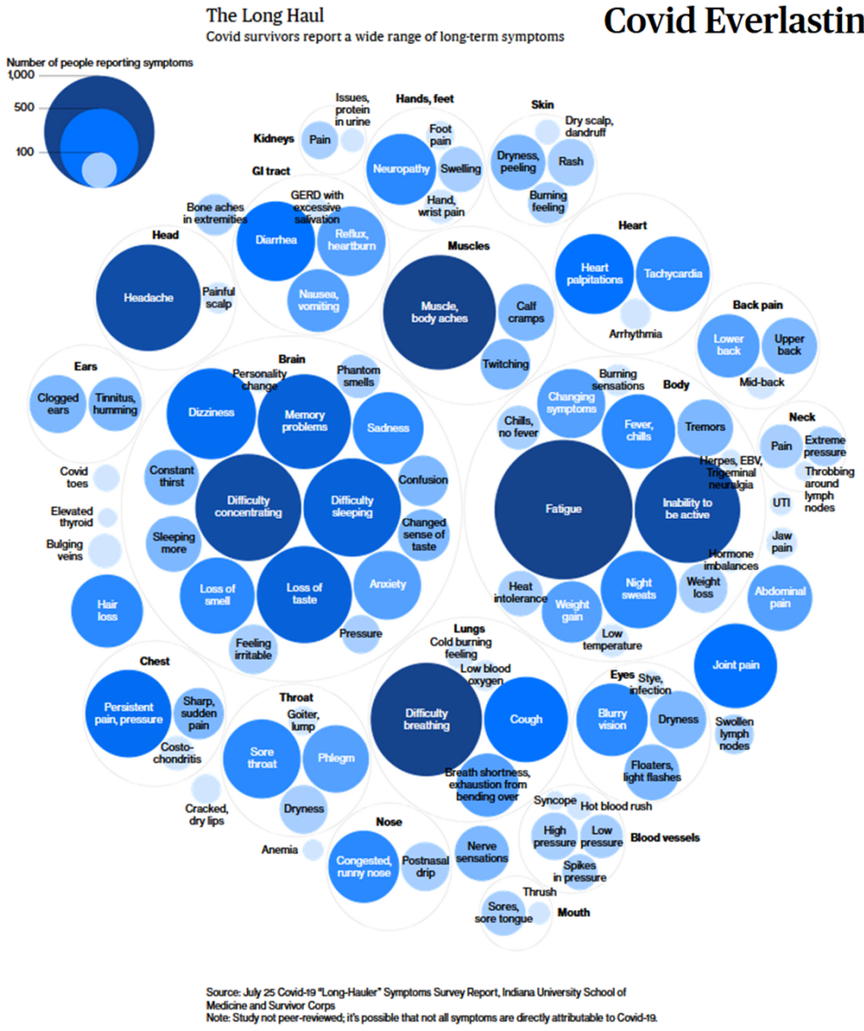


A transdisciplinary perspective of chronic stress in relation to psychopathology throughout life span development

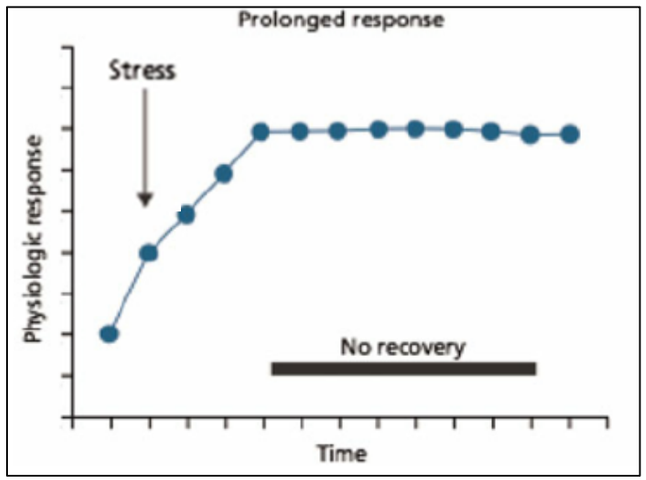
Robert-Paul Juster · Gustav Bizik · Martin Picard · [...] · Sonia J Lupien

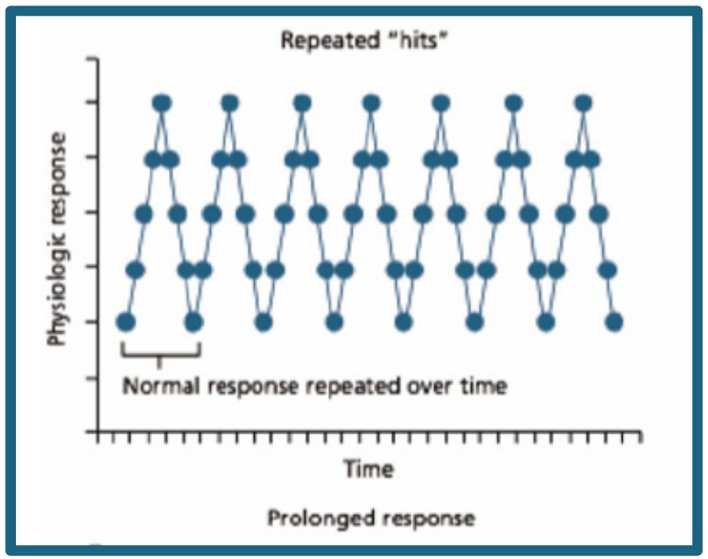
RESILIENCE

Covid Everlasting



Source: July 25 Covid-19 "Long-Hauler" Symptoms Survey Report, Indiana University School of Medicine and Survivor Corps
Note: Study not peer-reviewed; it's possible that not all symptoms are directly attributable to Covid-19.





A transdisciplinary perspective of chronic stress in relation to psychopathology throughout life span development

Robert-Paul Juster · Gustav Bizik · Martin Picard · [...] · Sonia J Lupien

ALLOSTATIC LOAD

RESILIENCE

STRESS RESPONSE
Fight, Flight, Freeze

RELAXATION RESPONSE
Rest & Digest

The Results Continuum

- Poor communication
- High stress
- Aggression
- Poor focus / retention

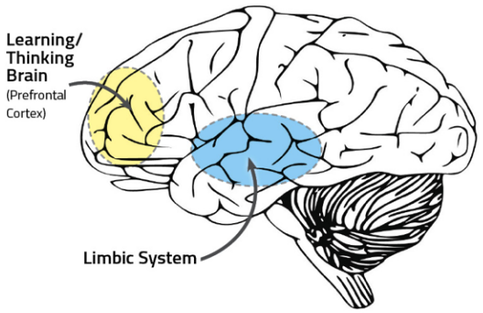
SURVIVAL/ STRUGGLE | NORMAL | SUPER PERFORMANCE

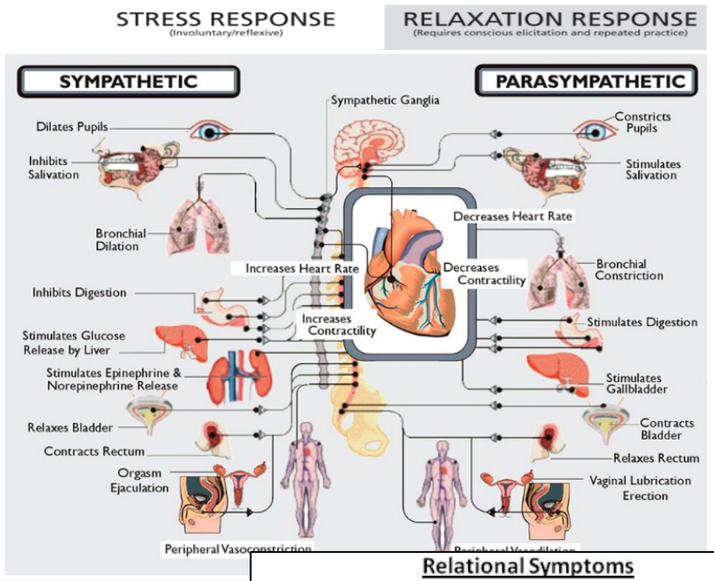
- Creativity
- Low stress
- Receptivity
- Learning

SOURCE: Dr. Herbert Benson
Benson-Henry Institute, MGH
Harvard Medical School

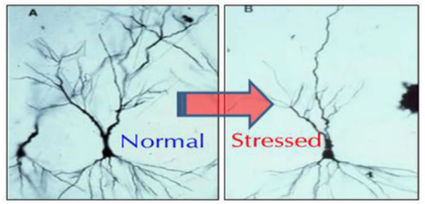
Survival Mode: Flight/Fight/Freeze

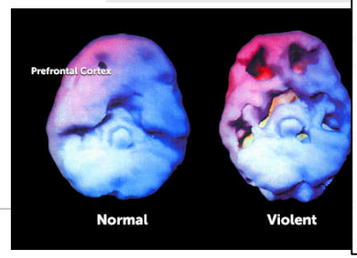
Frontal lobe (Prefrontal cortex) goes offline
Limbic system / mind and lower brain functions take over





Stress Shrinks Brain Networks





Relational Symptoms

____Isolation	____Lowered sex drive
____Intolerance	____Nagging
____Resentment	____Distrust
____Loneliness	____Lack of intimacy
____Lashing out	____Using people
____Hiding	____Fewer contacts with friends
____Clamming up	

Your Mind	Your Behavior	Your Emotions
• Worrying	• Insomnia	• Irritability
• Hasty decisions	• Accident prone	• Depression
• Impaired judgement	• Loss of appetite	• Loss of confidence
• Muddled thinking	• Loss of sex drive	• More fussy
	• Excessive drinking	• Apprehension
	• Smoking more	• Alienation
	• Restlessness	• Apathy

ALLOSTATIC LOAD

RESILIENCE

STRESS RESPONSE
Fight, Flight, Freeze

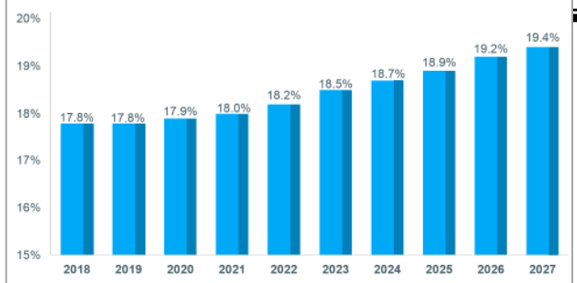
RELAXATION RESPONSE
Rest & Digest

The Results Continuum

SURVIVAL/ STRUGGLE | NORMAL | SUPER PERFORMANCE

SOURCE: Dr. Herbert Benson
Benson-Henry Institute, MGH
Harvard Medical School

Figure 1. Projected US Healthcare Expenditures as a Percentage of GDP, 2018–2027

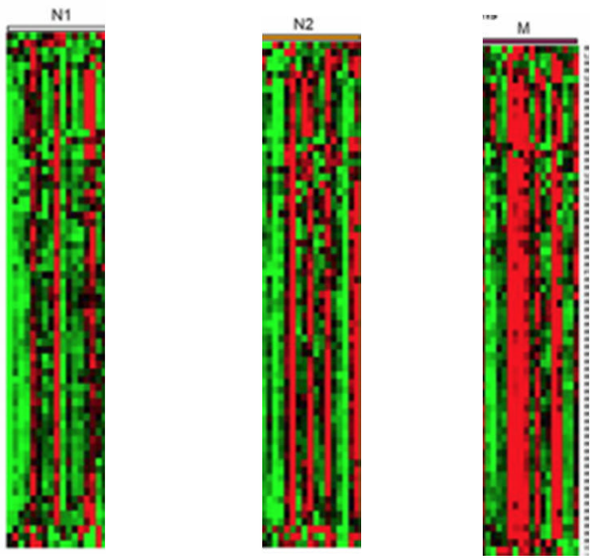


Sources: Centers for Medicare & Medicaid Services. National Health Expenditure Projections 2018-2026. Forecast Summary and Selected Tables.

- Altered epigenetics (gene expression)

FIGURE 2. GSEA ANALYSIS.

GROUP 1 GROUP 2 GROUP 3



Heavy Cost of Cancer Treatments

Average Monthly Income Pre-Tax
$3,600

Average Monthly Cost of Cancer Treatments

Chemotherapy
$1,000 - $12,000

Radiation
$9,000

Immunotherapy
$10,000 - 12,500

Sources: U.S. Bureau of Labor Statistics, 2018; DrugPricingLab, 2019; JAMA Oncology, 2019

Dusek JA, Otu HH, Wohlhueter AL, Bhasin M, Zerbini LF, et al. (2008) Genomic Counter-Stress Changes Induced by the Relaxation Response. PLOS ONE 3(7): e2576. https://doi.org/10.1371/journal.pone.0002576
http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0002576

Increased Levels of A-Load and…

- Socio-economic (SES)
- Socio-demographics
- Segregation / Marginalization
- Discrimination / Inequity
- Changes in demography

Stress, Place, and Allostatic Load Among Mexican Immigrant Farmworkers in Oregon

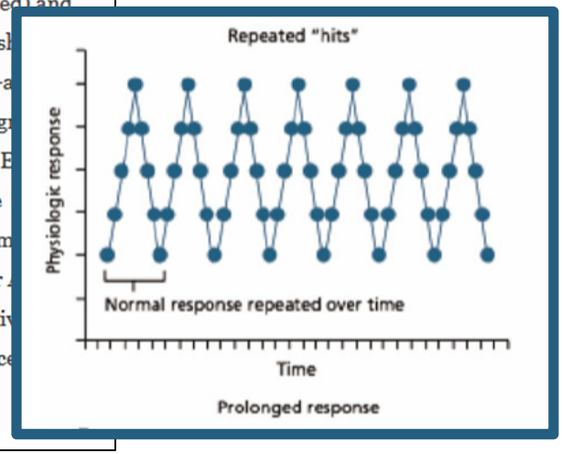
Abstract

Cumulative exposure to chronic stressors has been shown to contribute to immigrants' deteriorating health with more time in US residence. Few studies, however, have examined links among common psychosocial stressors for immigrants (e.g., acculturation-related) and contexts of immigrant settlement for physical health. The study investigated relationsh among social stressors, stress buffers (e.g., family support), and allostatic load (AL)—a summary measure of physiological "wear and tear"—among 126 adult Mexican immigr farm workers. Analyses examined social contributors to AL in two locales: (1) White, E speaking majority sites, and (2) a Mexican immigrant enclave. Our six-point AL scale incorporated immune, cardiovascular, and metabolic measures. Among men and wom older age predicted higher AL. Among women, lower family support related to higher A White majority communities only. Findings suggest that Latino immigrants' cumulati experiences in the US significantly compromise their health, with important differenc community context.

McClure, H.H., Josh Snodgrass, J., Martinez, C.R. *et al.* Stress, Place, and Allostatic Load Among Mexican Immigrant Farmworkers in Oregon. *J Immigrant Minority Health* **17**, 1518–1525 (2015). https://doi.org/10.1007/s10903-014-0066-z

Community environments influence the A-Load of individuals.

Chandra, Cahill, Yeung, & Ross (2018)



Nativity differences in allostatic load by age, sex, and Hispanic background from the Hispanic Community Health Study/Study of Latinos

Christian R. Salazar [a,*], Garrett Strizich [a], Teresa E. Seeman [b], Carmen R. Isasi [a], Linda C. Gallo [c], Larissa M. Avilés-Santa [d], Jianwen Cai [e], Frank J. Penedo [f], William Arguelles [g], Anne E. Sanders [h], Richard B. Lipton [a,i], Robert C. Kaplan [a]

https://doi.org/10.1016/j.ssmph.2016.05.003

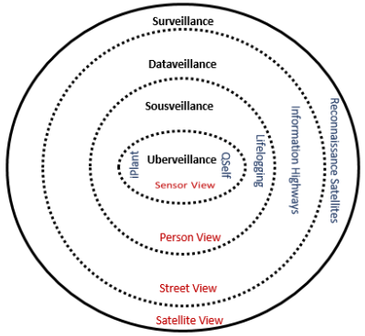
Highlights

- ALoad was highest among US-born individuals
- Aload intermediate in foreign-born Hispanics/Latinos with longer duration in the US.
- Aload lowest among those with shorter duration in the US

Abstract

Allostatic load (AL), an index of biological "wear and tear" on the body from cumulative exposure to stress, has been little studied in US Hispanics/Latinos. We investigated AL accumulation patterns by age, sex, and nativity in the Hispanic Community Health Study/Study of Latinos. We studied 15,830 Hispanic/Latinos of Mexican, Cuban, Dominican, Puerto Rican, Central and South American descent aged 18–74 years, 77% of whom were foreign-born. Consistent with the conceptualization of AL, we developed an index based upon 16 physiological markers that spanned the cardiometabolic, parasympathetic, and inflammatory systems. We computed mean adjusted AL scores using log-linear models across age-groups (18–44, 45–54, 55–74 years), by sex and nativity status. Among foreign-born individuals, differences in AL by duration of residence in the US (<10, ≥10 years) and age at migration (<24, ≥24 years) were also examined. In persons younger than 55 years old, after controlling for socioeconomic and behavioral factors, AL was highest among US-born individuals, intermediate in foreign-born Hispanics/Latinos with longer duration in the US (≥10 years), and lowest among those with shorter duration in the US (<10 years) ($P<0.0001$ for increasing trend). Similarly, AL increased among the foreign-born with earlier age at immigration. These trends were less pronounced among individuals ≥55 years of age. Similar patterns were observed across all Hispanic/Latino heritage groups (P for interaction=0.5). Our findings support both a "healthy immigrant" pattern and a loss of health advantage over time among US Hispanics/Latinos of diverse heritages.

THE VEILLANCES
(Emerging future state = Convergence)



1. Insightfulness

With context-awareness and context-adaption, networks of ubiquitous devices will be continuously "on" and autonomously learning behaviors. With data gleaned across all veillances, devices will assess humans in multiple contexts, capacities, and over time. This is likely to lead to a capability for the system to have rich insightfulness, or a precise and profound understanding of humans in the current, but also future, state. As the veillances converge, will this yield a world in which the watchers have an unique advantage with profound insight derived through an accurate, multilayered, intuitive understanding of the human?

2. Imperceptible

As networks are operating behind the line of visibility, humans are not likely to comprehend the scope, reach, or even timing of data practices. The processes and procedures are likely to be imperceptible. Users could be blinded to what is collected, by whom, for how long, how it is synthesized with other data, and who owns the data now - or in the future. As the veillances converge, will this yield a world in which the man does not perceive the watching, and as a result, nor the consequences of being watched?

3. Incomprehensibility

Our current state of terms and conditions are often murky and/or mutable. Additionally, the average human is not likely to comprehend the wide-ranging system, nor the risks associated across multiple organizations sharing data. The system is likely to be incomprehensible for the consumer. Simpler technologies have already proven to be complex and convoluted to the average consumer. As the veillances converge, will this yield a world in which a human must opt-in to stipulations that are unrealistic to comprehend?

4. Indelibility

Data may become ineradicable. Our digital footprints are likely to leave an indelible history of analyzable behaviors, especially if we d
As the veillances converge,
humans comprehend the lon

5. Invasiveness

As we allow technology
systems in which not only o
will this yield a world in wh
even if unintended?

6. Involuntariness

It is evermore compulsor
receive extensive services a
belong and benefit socially,
veillances converge, will th

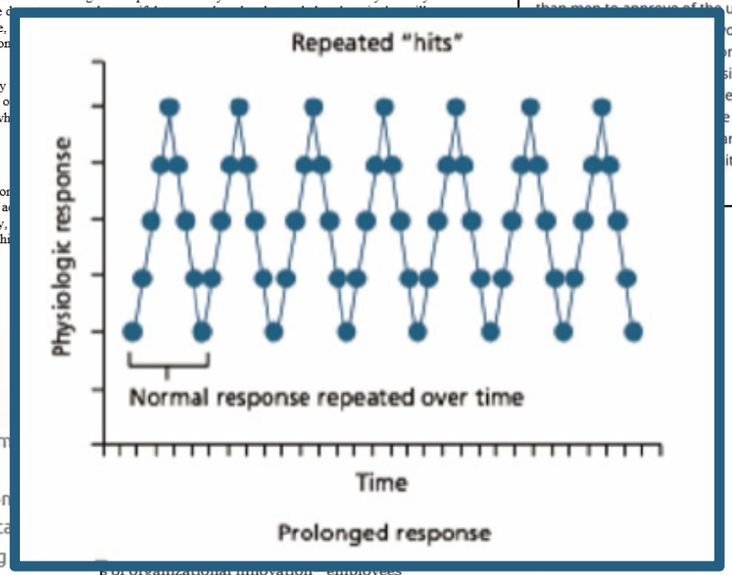
"I Don't Want Someone to Watch Me While I'm Working": Gendered Views of Facial Recognition Technology in Workplace Surveillance

Luke Stark, Amanda Stanhaus, Denise L. Anthony

First published: 10 March 2020 | https://doi.org/10.1002/asi.24342

Abstract

Employers are increasingly using information and communication technologies to monitor employees. Such workplace surveillance is extensive in the United States, but its experience and potential consequences differ across groups based on gender. We thus sought to identify whether self-reported male and female employees differ in the extent to which they find the use of workplace cameras equipped with facial recognition technology (FRT) acceptable, and examine the role of privacy attitudes more generally in mediating views on workplace surveillance. Using data from a nationally representative survey conducted by the Pew Research Center, we find that women are much less likely
use of cameras using FRT in the workplace. We then further
omen think diff
nship between
sider the implic
echnologies, an
gendered. Not
re invariably pa
itations, we wer



"Big brother is watching you": surveillance via technology undermines employees' learning and voice behavior during digital transformation

Julia M. Kensbock & Christoph Stöckmann

Journal of Business Economics (2020) | Cite this article

How Much is Too Much: Employee Monitoring, Surveillance, and Strain

Tripti Singh, The University of Alabama
Allen Johnston, University of Alabama

ASSOCIATION FOR INFORMATION SYSTEMS

To maintain security, organizations use increasingly sophisticated methods to m
employees, such as checking emails, tracking employee's website connections,
collecting keystrokes, and surveilling social media activity. While electronic mon
and surveillance (EM/S) practices represent an attempt to secure the firm's data
more, they also may have an unintended consequence of creating strain among
employees. In this study, we examine EM/S practices, the characteristics of those
practices which cause strain and the negative, deviant and non-compliant behaviors
the strain evoke in the EM/S subjected employees. We draw from the techno-stress
and EM/S literature to build a research model that describes the relationship between
EM/S, strain, and employees' EM/S related deviant and non-compliant outcomes. The
research concludes with the discussion of our plan for testing the research model and
its potential implications for research. https://aisel.aisnet.org/icis2019/cyber_security_privacy_ethics_l5/cyber_security_privacy/31/

ir learning orientation) and employees' willingness to
ons (i.e., their voice behavior). We conducted a survey
dustries that are currently disrupted by digitization.
n theory, our findings show that digital
gage in an intrinsically motivated process during
which consequently motivates them to express voice
ss is counteracted by perceived surveillance via
technology. When employees feel that digital transformation is accompanied by increased surveillance, they are less likely to adopt a learning orientation and therefore less likely to engage in voice behavior. Theoretical as well as practical implications are discussed.

Societal Contexts

Digitization:
Converging Processes

Neurobiology of Addiction

(AbD)

Neurobiology of Stress

(VUCA, etc.)

WIRED: The impact of media and technology use on stress (cortisol) and inflammation (interleukin IL-6) in fast paced families ☆

Computers in Human Behavior
Volume 81, April 2018, Pages 265-273
https://doi.org/10.1016/j.chb.2017.12.010

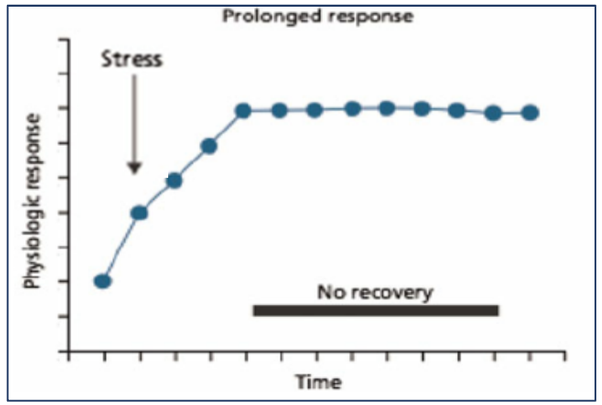
Tamara D. Afifi [a], Nicole Zamanzadeh [a], Kathryn Harrison [a], Micelle Acevedo Callejas [b]

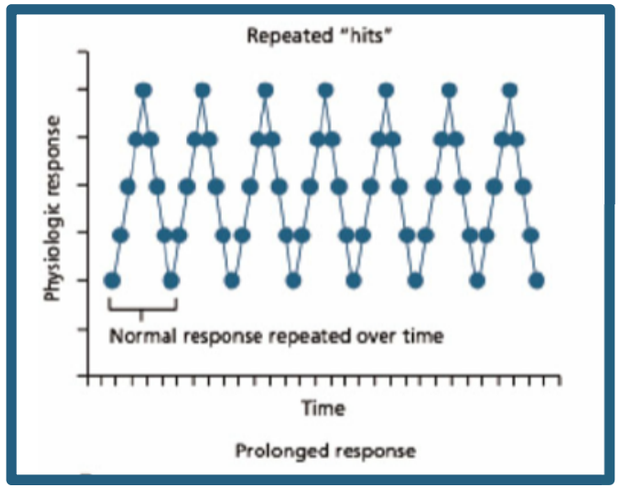
Highlights

- Despite being digital natives, technology most affects adolescents' biomarkers of stress.
- Fathers and adolescents experienced rises in their CAR and higher IL-6 due to technology use.
- Bedtime and general use were related to an increase in CAR for adolescents, but a decrease for fathers.

Abstract

This study examined how technology and media use affect stress (cortisol) and inflammation (interleukin IL-6) in dual earning parents and their adolescents. Sixty-two families reflected on their technology use the past week and collected saliva on two consecutive days that week. Technology use had the greatest effect on adolescents. Adolescents with greater phone use, general media exposure, and larger social networks via Facebook had a greater rise in their cortisol awakening response (CAR) and higher IL-6. Fathers' phone use and email were also associated with an increase in their CAR and IL-6. When bedtime technology use was high, greater general media use was associated with an increase in CAR for adolescents, but a decrease for fathers. Technology use did not significantly affect cortisol diurnal rhythm or mothers' biosocial markers. This study contributes empirical evidence of the physiological consequences of technology use among family members and provides potential theoretical explanations for future research.





Information and communication technology overload and social networking service fatigue: A stress perspective

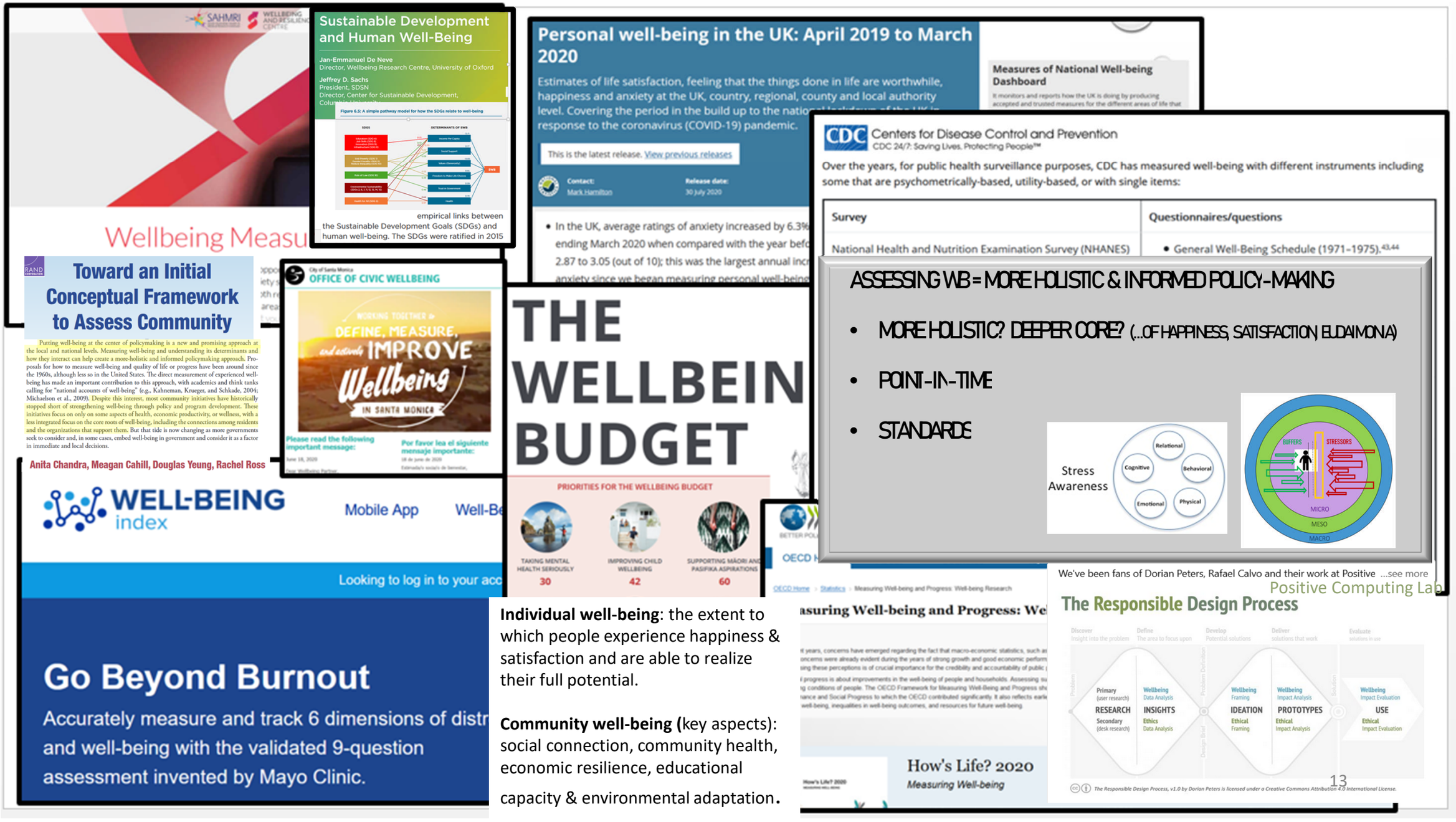
Ae Ri Lee [a], Soo-Min Son [b], Kyung Kyu Kim [b]
https://doi.org/10.1016/j.chb.2015.08.011

Highlights

- We examine SNS fatigue as an outcome of the stress process.
- Three dimensions of overload are significant stressors influencing SNS fatigue.
- Information and system characteristics of SNSs are determinants of overload.

Abstract

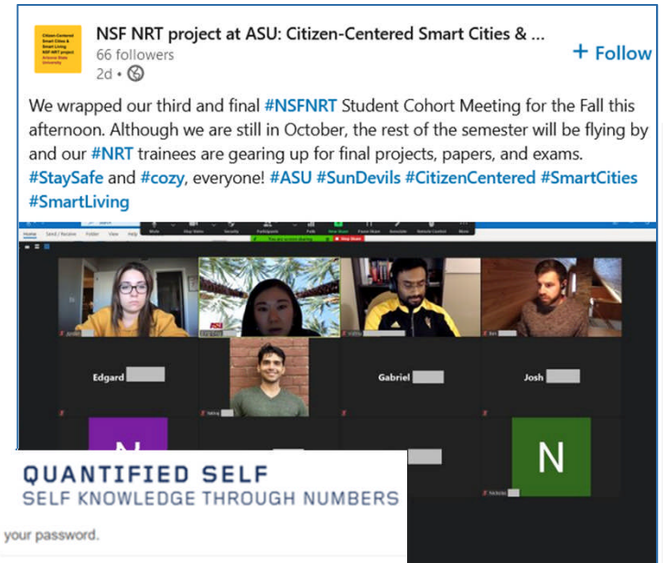
In an always connected communication environment, users of social networking services (SNSs) need to pay continuous attention to the overwhelming volume of social d nds from S ese increased energy requirements may cause SNS tigue, ch ca and psychological strain. Using the transactional th and c erarching theory, this study regards overload of SNS fatigue (i.e., strain) and identifies three fo on overload, communication overload, and ncludes SNS characteristics as the antecedents of

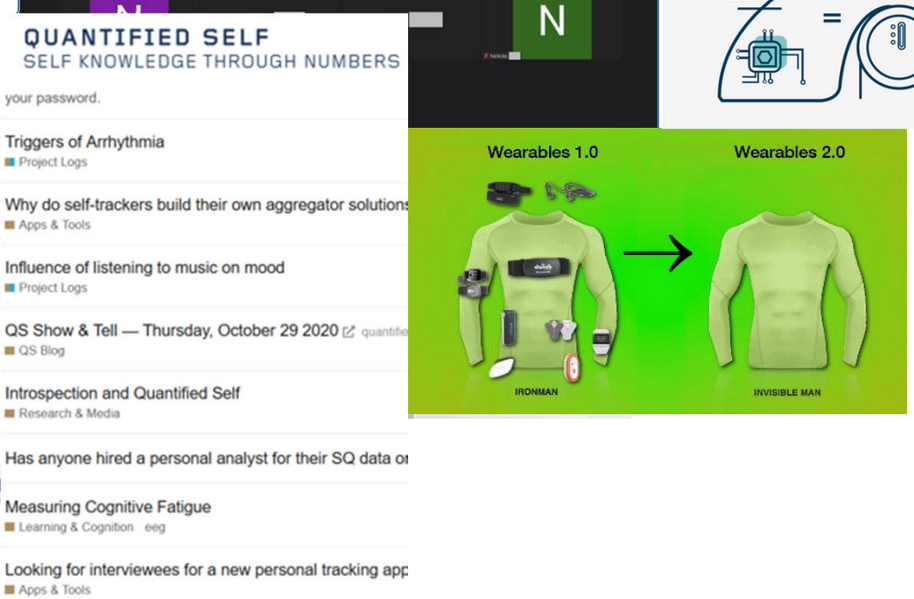


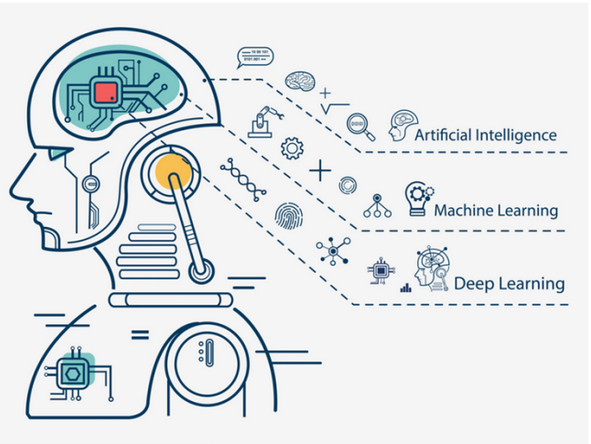
Individual well-being: the extent to which people experience happiness & satisfaction and are able to realize their full potential.

Community well-being (key aspects): social connection, community health, economic resilience, educational capacity & environmental adaptation**.**

https://www.kaleidoinsights.com/modern-wellbeing-infographic-mapping-impacts-on-mind-body-environment-and-communities/







Our work in an Age of A-Load

(Allostatic Load)

GAPS IN LITERATURE

- **BROADEN & DEEPEN METHODOLOGIES**
  - HISTORY OF STRESS RESPONSE
  - CATALOG OF STRESS EXPERIENCES
  - PERCEPTIONS OF STRESS
  - CORE ROOTS (UPSTREAM FROM WB?)
  - MORE HOLISTIC?
- **STANDARDS**

POSSIBILITIES

INTERVENTIONS: MORE EFFECTIVE & EFFICIENT

- TAILORED TO THE NEEDS OF DIVERSE POPULATIONS
  - DEEPER UNDERSTANDING MOST SALIENT STRESSORS
  - DEEPER UNDERSTANDING MOST SALIENT BUFFERS
  - MAP TO COMMUNITY VALUES
- MORE TARGETED RESOURCES
  - REMOVE BARRIERS
  - LESS WASTE
- IMPROVE PROSOCIAL BEHAVIORS

Thank you!