

Institution: University College London		
Unit of Assessment: UoA 17 Business & Management Studies		
Title of case study: Improving healthcare, service, and government operations and outcomes through an understanding of visual information and transparency		
Period when the underpinning research was undertaken: 2012- 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Chia-Jung Tsay	Role(s) (e.g. job title): Associate Professor	Period(s) employed by submitting HEI: 2012-present
Period when the claimed impact occurred: 2016-present		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact Dr Chia-Jung Tsay has developed a programme of research to investigate how visual information factors into decision making processes. Tsay and her colleagues have examined how visual or 'operational transparency' may be leveraged to create value for organisations. Dr Tsay led UCL efforts to collaborate with the UK's Behavioural Insights Team (BIT), an international think tank originally set up within the UK Cabinet Office, that applies behavioural insights to inform policy, improve services, address social problems, and deliver results for people and communities. Dr Tsay and her work have motivated BIT to apply empirical findings to their work with the NHS. Dr Tsay's research output has been widely covered across live television interviews and broadcasts, radio, and print media across over 50 countries, ranking in the 99th percentile of all articles ever tracked by Altmetric for research impact.		
2. Underpinning research The underpinning research was undertaken by Chia-Jung Tsay, Associate Professor at the UCL School of Management, in collaboration with Ryan Buell, currently at Harvard Business School, and Tami Kim, currently at the Darden School of Business at the University of Virginia. Dr Tsay's primary stream of research examines the dominance of visual information in judgement about performance, includes initial tests of the impact of visual cues [a], assessment of generalizability and consequences of the dependence on visual cues [b], [c], and investigates how the vision heuristic and visual transparency can be leveraged to create value for organisations [d], [e]. Across domains, the judgment of performance occupies a key area of investment. Experts are trained and societal institutions are constructed to identify, develop, and reward the highest levels of achievement. We trust that professionals can judge performance through their specialized knowledge. Yet, experts are just as vulnerable as novices to the vision heuristic, a mental shortcut that operates below the level of consciousness such that people draw upon visual information more than auditory information. Given the effect on professional evaluation and decision-making, such biases can affect how organizations select and recruit top talent. In Dr. Tsay's first studies about the power of visual information [a,b], the domain of music offered a strong test of the possible dominance of visual cues about performance. Both novices and professional musicians were able to select the actual winners of live classical music competitions based on silent video recordings, but they were not able to identify the winners based on sound recordings or recordings with both video and sound. The vision heuristic, demonstrated empirically for the first time and recognized as novel and important through publication in a world-leading multi-sciences journal, <i>Proceedings of the National</i>		

Academy of Sciences, points to a powerful effect of vision-biased preferences on selection processes even at the highest levels of performance.

The vision heuristic extends to judgments of teams and group processes, with further findings published in a leading management journal, *Organizational Behaviour and Human Decision Processes*, which suggest that the professional judgment of group performance is driven primarily by visual cues about group dynamics, leadership, and status [b]. In further testing the generalizability of the vision heuristic, work involving entrepreneurship competitions was published in a leading management journal, *Academy of Management Discoveries*, and offers prescriptions for venture capital decision making [c].

The initial foundational work on the power of visual information prompted investigations of how the vision heuristic may be leveraged to create value. Tsay and colleagues explored the effects of visual or operational transparency on customer perceptions and service outcomes, the findings of which were published in a leading management journal, *Management Science* and the top practitioner journal for managers, *Harvard Business Review*. The work varied the degree to which operating processes in food service settings are visible to customers and find that transparency optimized customer and employee experiences.

Seeing the employees' work caused customers to better appreciate the effort exerted by employees, increasing their perceptions of service value. Seeing the customer caused employees to feel more appreciated and feel that their work is more impactful, which in turn increased their job satisfaction and willingness to exert effort, resulting in better performance. Seeing and appreciating the people who help us, and allowing them to see us in return, can lead to experiences that are objectively better and more fulfilling for everyone involved.

The results cast visual or operational transparency as one additional lever that service managers may consider to improve the efficiency of their processes and the quality of outcomes they deliver. Dr. Tsay's stream of research on the impact of visual information is directly responsible for prompting the work on transparency, as illustrated in how visual or operational transparency refers specifically to the visual revelation of operating processes, and designs that introduce visual transparency into the customer experience. By leveraging transparency to grant producers and consumers access to visual information, organisations have the potential to tap into a virtuous cycle that enhances both perceived and objective service performance [d, e].

3. References to the research

All output listed below has been through rigorous peer review. The output has also yielded recognition including contributing to Dr Tsay's Association for Psychological Science (APS) Rising Star award in 2018, and Dr Tsay's SEMPRES/ICMPC Young Researcher Award in 2011.

The output has been used as reference points for further research beyond the original institution. For example, [a] and [e] have been cited 316 times over just several years, and [a] ranks in the 99th percentile of all articles ever tracked by Altmetric for research impact.

[a] Tsay, C (2013). Sight over sound in judgment of music performance. *Proceedings of the National Academy of Sciences*, 110(36), 14580-14585.

<https://doi.org/10.1073/pnas.1221454110> [submitted to REF2014]

[b] Tsay, C (2014). The vision heuristic: Judging music ensembles by sight alone. *Organizational Behaviour and Human Decision Processes*, 124(1), 24-33.

<https://doi.org/10.1016/j.obhdp.2013.10.003> [submitted to REF2021]

[c] Tsay, C (2020). Visuals dominate investor decisions about entrepreneurial pitches.

Academy of Management Discoveries (in press). <https://doi.org/10.5465/amd.2019.0234>

[d] Buell, R., Kim, T., & Tsay, C. (2014). Cooks make tastier food when they can see their customers. *Harvard Business Review*, 92(11), 800.

[e] Buell, R., Kim, T., & Tsay, C. (2017). Creating reciprocal value through operational transparency. *Management Science*, 63(6), 1673-1695.

<https://doi.org/10.1287/mnsc.2015.2411> [submitted to REF2021]

4. Details of the impact

Dr Tsay and colleagues have built research on the vision heuristic and visual or operational transparency by engaging with practitioners and developing user-friendly ways to leverage the power of visual information. In terms of recruitment and selection processes, Dr Tsay has engaged with a range of corporate and government entities, to help shape their future, long-term policies.

In 2019, Dr Tsay led UCL efforts to collaborate with the UK's Behavioural Insights Team (BIT), coinciding with BIT's efforts to apply the concepts of transparency in their field work. BIT is an international think tank originally set up within the UK Cabinet Office, that applies behavioural insights to inform policy, improve services, address social problems, and deliver results for people and communities. Dr Tsay was introduced to BIT in 2014 by colleagues at Harvard Business School, and has contributed to several BIT events in London, including as a speaker and university host for the Behavioural Insights Group Immersive Field Course in January 2018, and as a speaker for the Behavioural Science for Policy Seminar Series on October 8, 2018. For both events, Dr Tsay presented the body of work on the vision heuristic and visual or operational transparency [a, b, c, d, e]. As such, BIT was familiar with Dr Tsay's work through both networks and presentations; both the former BIT Chief Scientist and a Senior Advisor at BIT, discussed with Dr Tsay and colleagues the continued application and impact of visual or operational transparency [1]. Dr Tsay and colleagues have welcomed practitioners to adapt the concept of transparency in ways that are most suitable and useful for their respective purposes.

In line with BIT's work with the NHS mental health programme Improving Access to Psychological Therapies (IAPT), BIT aimed to utilise the concept of "transparency" as conceptualized by Tsay and colleagues' research [d, e], to help provide a solution to a common NHS problem- where 1.4 million people were referred to IAPT (in 2018/2019), 3 in 5 people did not complete a course of treatment. Based on Tsay and colleagues' key finding that people may experience additional gains when they have some way to appreciate the effort that contributes to a service [d, e], BIT tested sending a series of visual reminders in the form of text messages to patients on IAPT waiting lists, giving them updates from the service and reassurance that it was working to increase patient engagement whilst they were on the waiting list.

By allowing people to become more aware of the process of their treatment, BIT found patients became more likely to attend follow up treatment appointments, were less likely to drop out of treatment, and attended more appointments on average [2]. Using the concept of transparency allowed improvements and greater efficiency in the provision of mental health services. BIT estimated that where the low cost intervention could be scaled up, it could result in an additional 14,000 patients per year completing follow up appointments [2].

As a consequence of this finding by BIT, in January 2020, IAPTUS (a patient management software firm specialising in psychological therapies), announced a new product to their patient management system, "Scheduled Bulk SMS," which would allow users to automatically send text messages to all patients the day after their referral. IAPTUS noted in a press release [4] that "carefully crafted text messages to patients between referral and first appointment can be used to increase engagement and reduce DNAs (Did Not Attend)," whilst highlighting "the standard cost of sending each SMS is typically recouped in the saving of just one or two

missed appointments” [3], therefore with the opportunity to relieve financial pressure on NHS trusts.

Similarly, transparency was tested in the form of shared appointments in a different healthcare setting, the Aravind Eye Hospital in India, in which patients become visually aware of the examinations of other patients. The findings suggest that transparency can result in higher satisfaction and engagement, higher medication compliance, and higher rates of follow up appointments [4]. Through a randomized controlled trial with 1,000 patients undergoing glaucoma treatment, the shared service delivery model, relative to a one-on-one setting, resulted in patients who asked 37.2% more questions per minute, made 8.2% more comments per minute, answered 3.6% more questions per minute, and exhibited higher levels of non-verbal engagement.

The work on transparency has also been further developed by colleagues worldwide [5]. For example, it has even been shown to increase people’s trust in organisations and settings that otherwise would garner low trust. For example, the Pew Research Center indicates that only 20% of Americans report trusting the government to do the right thing. A Harvard Business School group collaborated with the City of Boston, following 21,786 residents and their engagement with a smartphone application that submits service requests to the city government’s Public Works Department. By leveraging the concept of transparency and showing visual images of work being requested and performed, people became more trusting and supportive of the Boston city government. Importantly, citizen engagement increased, resulting in a 60% increase in the number of requests made monthly [4]. This work cites both the vision heuristic and operational transparency research [b, e].

The stream of research on the power of visual information and transparency has garnered wide public interest, with coverage in media outlets in over 50 countries, including the *Atlantic*, *BBC* (print, radio, live television broadcasts), *Boston Globe*, *Business Insider*, *Chicago Tribune*, *the Economist*, *Financial Times*, *Forbes*, *Harvard Business Review*, *Le Figaro*, *Le Monde*, *Nature*, *NPR* (print, live radio broadcasts), *Radio France*, *Scientific American*, *TIME*, and *the Wall Street Journal*. This research has also raised the interest of industry leaders and other academics, resulting in Dr Tsay delivering 93 seminars and keynote speeches since 2013.

5. Sources to corroborate the impact

1. Testimonial from Senior Advisor at BIT.
2. BIT article ‘How can we support mental health patients on waiting lists? Using text messages to increase engagement’ (7th February 2019).
3. IAPTUS press release (<https://iaptus.co.uk/2020/01/send-text-messages-to-multiple-patients-at-once/>)
4. *Harvard Business Review* article on operational transparency (<https://hbr.org/2019/03/operational-transparency>)
5. *McKinsey Quarterly* article on operational transparency and meaningful work <https://www.mckinsey.com/business-functions/organization/our-insights/making-work-meaningful-a-leaders-guide>.