

A Role for Eye-Tracking Research in Accounting and Financial Reporting?

Lyn Grigg and Amy L. Griffin

1 Introduction

Eye tracking is well used in usability studies (Goldberg and Wichansky 2003), for marketing and ecommerce (Wedel and Pieters 2006), as well as for fundamental research in neuroscience and visual processing (Blair et al. 2009) and developmental psychology (Johnson et al. 2004). However, it can also be applied to disciplines such as accounting. In this chapter, we describe why we believe behavioural studies supported by eye tracking are essential for improving financial decision making, both in Australia and globally. We provide examples from a pilot study to support our contention.

Today there is a plethora of legislation, standards and guidelines on how to report financial information, with oversight by numerous government and professional accounting bodies at both national and international levels. For example, Australian public companies are required to generate financial reports under the Corporation Act 2001 (Cwlth), in compliance with the International Financial Reporting Standards (IFRS), the Australian Accounting Standards and regulatory guides that require disclosure of non-IFRS financial information (e.g. RG230), issued by the Financial Reporting Council (FRC), which was established under the Australian Securities and Investments Commission (ASIC) Act 2001.

Regardless of *how* information is required to be reported, there has also been an increase in the complexity and amount of *what* information is reported. Furthermore, there has been a shift towards developing a vast array of business, performance and key indicator reports to support traditional financial reporting (Guthrie and Boedker 2006). For example, see the latest initiatives under the International Integrated Reporting Committee (IIRC), which come out of the United Nations Global Reporting Initiative (GRI) and the Prince Charles Accounting for Sustainability project.

The users of this plethora of financial information are at a tremendous disadvantage. The basis of financial reporting is a series of technical documents coming

A. L. Griffin (✉) · L. Grigg
University of New South Wales, Canberra, NSW, Australia
e-mail: a.griffin@adfa.edu.au

out of a process that records a business's financial transactions. These documents, by their nature, are not necessarily user-centred reporting documents designed for non-experts. Hence, the accounting and financial industries rely on and demand that users (e.g. company directors and audit committee members) have the skills to analyse and interpret these documents to make decisions (McDaniel et al. 2002). Given the complexity of these technical documents, their use requires a high degree of financial literacy. This view that users must 'fit the system' pervades much of the thinking concerning the development of accounting and financial reporting, and related information for decision making.

This chapter reports on our initial attempts to build a research programme dedicated to conducting user studies of financial reports in order to derive guidelines for producing truly user-centred financial and business reports.

2 Methodology

We are not interested in changing or confronting the legal and professional requirements imposed in financial reporting. Rather, we seek to initiate greater understanding of how users perceive these and other forms of financial and related non-financial information that guide decision making by stakeholders. To this end, eye tracking provides the opportunity to do behavioural research that provides valuable information in an unobtrusive way. To date, we have found no published literature that uses eye tracking for studying financial reports or related business reports. Notwithstanding this, Locarna (2012) does report on their website some work in progress at Simon Fraser University in which an eye tracker was used to document visual attention patterns when users viewed several new proposed accounting reports. They noted that eye tracking helped to develop a financial report that was easier to read, showed key information faster and with greater accuracy.

We have conducted a small pilot study to investigate the extent to which eye tracking can provide information that is of value in understanding what participants see in financial reports. In the pilot study, we showed participants a standard public company Statement of Financial Position (Balance Sheet). The company's name was removed and the financial years were changed to prevent users from guessing the identity of the company whose financial information was reported, avoiding users' reliance on memory of the company's history and requiring the use of information in the financial document to complete each task. Four participants, who had varying levels of professional and formal accounting education and/or experience in accounting, ranging from 0 to 5 years, looked at the financial statement.

We gave each participant the same scenario; he/she was a director of a company reviewing the company's financial statement. We asked them to answer five questions on key issues in financial analysis. The questions related to the company's ability to pay debts when they fall due, the efficiency of management in a key operational area, whether the business was debt or equity funded, if the business was profitable and whether the business appeared sound for the future.

While participants answered these open-ended questions, we recorded their reading behaviours using a Tobii x120 eye tracker, recording at 60 Hz. We displayed the financial report on a 21" LCD monitor using Adobe Acrobat. We used the Tobii Clearview fixation filter to identify fixations. Our behavioural measures included participants' answers to the questions, the time it took them to answer questions and a variety of metrics describing their fixation patterns and scanpaths, including fixation density maps, time to first fixation and visit durations (Duchowski 2007; Holmqvist et al. 2011; Pernice and Nielsen 2009).

3 Results

Our pilot study data suggest that eye tracking will be very helpful for measuring and describing the readability of financial reports, and identified several possible issues for users of these documents. These included the ease of finding information, and problems of accuracy and relevance. Furthermore, as would be expected, experience and education matter, leaving important questions to ask about the level of financial skills that can reasonably be expected of, for example, board members and what role education plays in skill development.

Figure 1 shows that accuracy and relevance are an issue for financial report users. Here, we asked participants to assess the level of working capital the company had. All participants answered the question correctly. However, it is also clear that all the participants missed the full story. To understand where the working capital was coming from, they would need to examine the receivables' notes, shown in the figure in the large green area of interest (AOI). The two accounting educated participants (red, blue; Table 1) did not examine the area at all. The non-accounting educated participants (orange and grey) reviewed the additional data, but their answers to later questions indicated that they did not have the background knowledge to understand the implications of this information.

Another question asked participants to identify if the management of the business was efficient as seen through accounts receivable (debtors) management. Figure 2 compares the participant with the most accounting experience (red), with each of the other participants. Here, we aimed to examine the effect of skill and knowledge on the ability to analyse and interpret a financial statement. The green AOIs indicate areas of the statement that are relevant to answering this question.

The panel at the upper left (red/blue; Fig. 2) shows that both participants saw all of the relevant information with a reasonable level of efficiency. This is perhaps not surprising given that both have an accounting degree and experience in the industry. The novice (upper right panel; grey) does find all of the relevant information, but the experienced accountant (red) was much more efficient than the novice. The participant with no accounting degree, but some experience in the field (right panel), is the least effective at finding the relevant information. This participant spends most of her time reading the labels rather than looking at the actual financial data and does not find all of the needed data.

Fig. 1 Identifying all relevant information

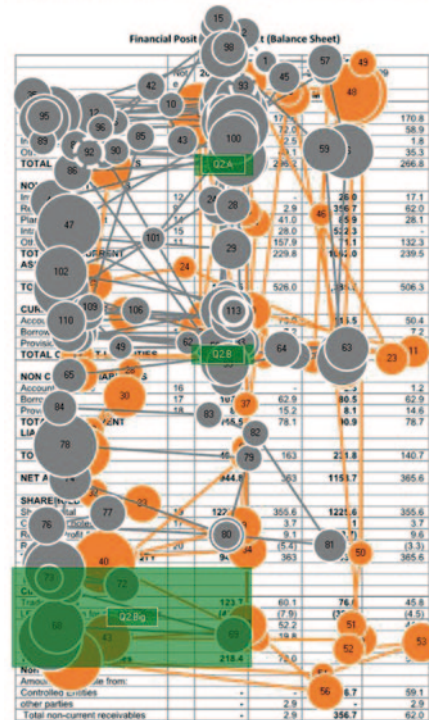
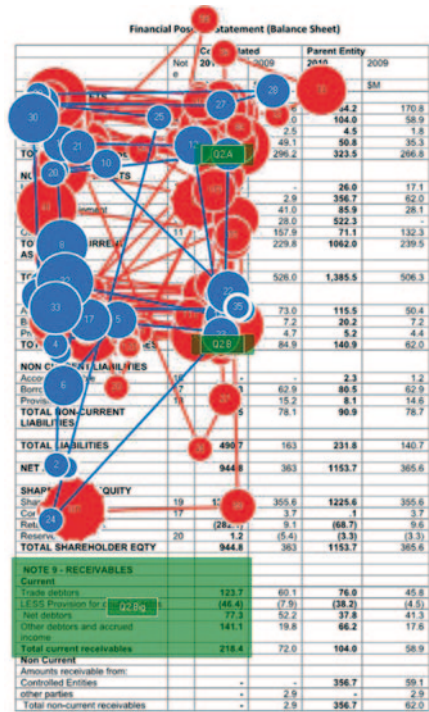


Table 1 Pilot study participant characteristics

Colour	Years worked in accounting	Has an accounting degree
Red	More than 5	Yes and professional accounting body accreditation
Blue	1–2	Yes
Orange	More than 5	No
Grey	None	No

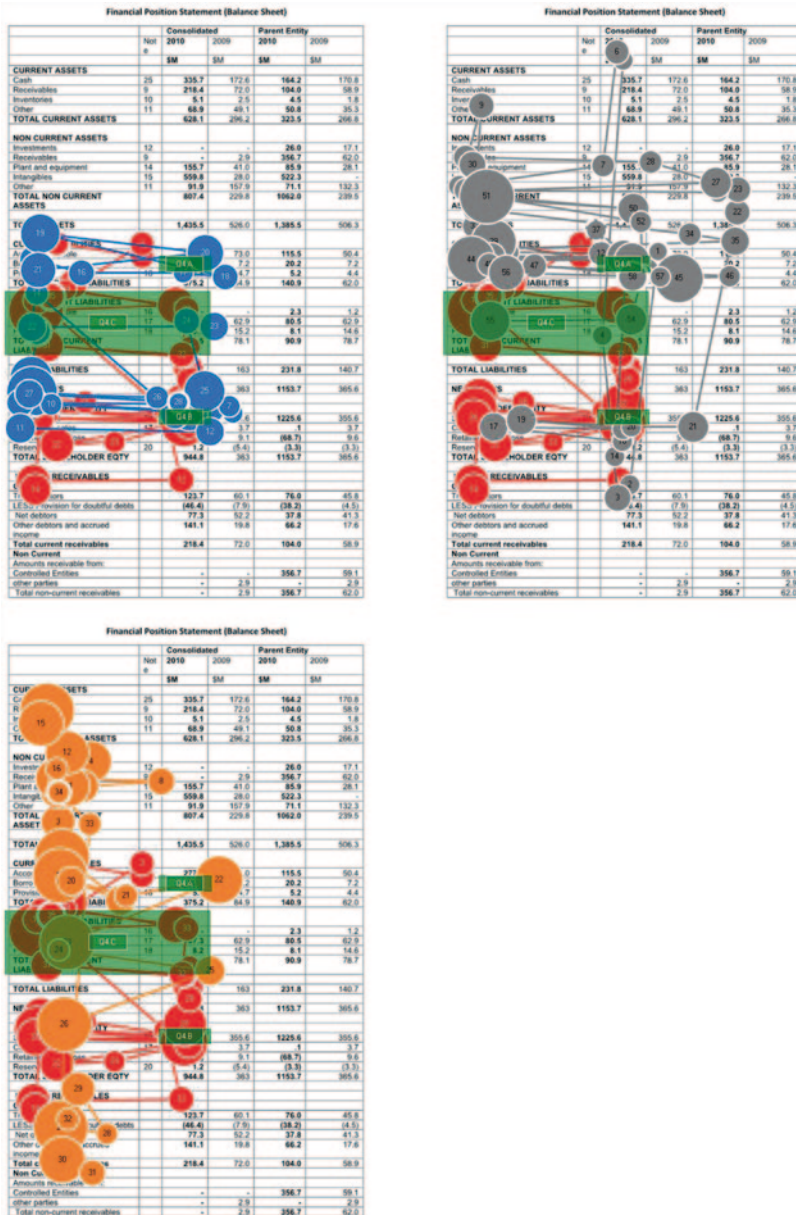


Fig. 2 Comparing user education and experience

4 Conclusion

We undertook this pilot study to determine whether eye tracking was likely to provide information that would be useful for improving the usability of financial reports. Our data indicated that financial statements that come out of a technical process are not particularly user centred and the statement was not easy to read. In terms of decision-making usefulness, even trained and experienced accountants had difficulty in finding the most relevant information. Our results demonstrate the potential for eye tracking to contribute to our understanding of financial decision making. Some potential research opportunities lie in improving readability and clarity of statements through identifying how users read financial statements and in developing alternative user-centred formats.

References

- Blair, M. R., Watson, M. R., Walshe, R. C., & Maj, F. (2009). Extremely selective attention: Eye-tracking studies of the dynamic allocation of attention to stimulus features in categorization. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 35(5), 1196–1206.
- Duchowski, A. T. (2007). *Eye tracking methodology* (2nd ed.). London: Springer.
- Goldberg, J. H., & Wichansky, A. C. (2003). Eye tracking in usability evaluation: A practitioner's guide. In R. Radach, J. Hyönä, H. Duebel (Eds.), *The mind's eye: Cognitive and applied aspects of eye movement research* (pp. 493–516). Amsterdam: North-Holland.
- Guthrie, J., & Boedker, C. (2006). Perspectives on “new” models of business reporting: A reflective note. *Accounting, Auditing & Accountability Journal*, 19(6), 785–792.
- Holmqvist, K., Nyström, M., Andersson, R., Dewhurst, R., Jarodzka, H., & van de Weijer, J. (2011). *Eye tracking: A comprehensive guide to methods and measures*. New York: Oxford University Press.
- Johnson, S. P., Slemmer, J. A., & Amso, D. (2004). Where infants look determines how they see: Eye movements and object perception performance in 3-month-olds. *Infancy*, 6(2), 185–201.
- Locarna (2012). *More transparent accounting*, accessed at <http://www.Locarna.com/applications.html> 1 July 2012.
- McDaniel, L., Martin, R. D., & Maines, L. A. (2002). Evaluating financial reporting quality: The effects of financial expertise vs. financial literacy, *The Accounting Review*, 77(Suppl. 2002), 139–167.
- Pernice, K., & Nielson, J. (2009). *Eyetracking methodology*, Fremont, CA: Nielsen Norman Group.
- Wedel, M., & Pieters, R. (2008). *Eye tracking for visual marketing, Foundations and trends in marketing*, Hanover, MA: nowPublishers Inc.