Accounting, Organizations and Society 55 (2016) 1–11

Contents lists available at ScienceDirect

Accounting, Organizations and Society

journal homepage: www.elsevier.com/locate/aos

How the timing of performance feedback impacts individual performance☆

Todd A. Thornock

College of Business, Iowa State University, 2167 Union Drive, 3335 Gerdin Business Building, Ames, IA, 50011-2027, USA

ARTICLE INFO

Article history:
Received 21 August 2014
Received in revised form
14 September 2016
Accepted 16 September 2016

Keywords:
Performance feedback
Timing of feedback
Learning costs
Performance
Learning

ABSTRACT

Using a multi-step task setting where learning can help improve individual task performance, I experimentally examine the effect of the timing of performance feedback in an initial period on future task performance when this feedback is absent. I find an inverted-U relation between the timing of feedback and future performance. When feedback is provided before implementation of an initial decision, high learning costs discourage individuals from learning in the initial period to the detriment of future performance. Further, when feedback is provided after extended delays beyond implementation of a decision, learning costs increase relative to those present when feedback is provided after a short delay, resulting in lower learning and future performance. As such, I find that providing feedback immediately following implementation of a decision most effectively promotes learning and future performance as this is the point at which learning costs are lowest. My study extends prior research on feedback timing by incorporating the notion that learning costs fluctuate throughout the phases of a multi-step task and offers practical implications for designing performance evaluation and feedback systems.

1. Introduction

Firms and individuals often engage in developing novel or innovative output. For example, a pharmaceutical company may develop a new drug, a manufacturing company may design a novel advertising campaign, or a researcher may develop new theory to explain a phenomenon. Developing this type of output can be viewed as the result of a multi-step task, with the implementation of each step resulting in success or failure. An understanding of what constitutes success and failure at each step is often needed to learn how to achieve the final output (e.g., an effective new drug, increased sales due to the advertising campaign, or theory that both explains and predicts). A lack of learning can lead to unrecognized failure with its accompanying costs, making recognition of failure highly valuable to firms and individuals.

In these examples, those engaging in the task can receive guidance (e.g., from clinical trials, from focus groups, or from other researchers) in the form of feedback of whether or not the firm or individual is on the right or wrong track to achieving the successful final output. I refer to this form of feedback as decision-quality feedback. Decision-quality feedback can improve learning and performance, yet much less is known about *when* in a multi-step task to provide this feedback in order to maximize learning and future performance. Hence, this study seeks to shed light on the effect of performance feedback timing (i.e., the phase of the task when decision-quality feedback is provided) on performance, particularly its effect on learning as measured by future performance.

This research is important for a number of reasons. First, performance feedback about decision making within an organization contributes to employee motivation and is a critical feature of performance evaluation and feedback systems (Luckett & Eggleton,

☆ This paper is based on my dissertation completed at the University of Texas at Austin. I appreciate the excellent guidance of my co-chairs, Steve Kachelmeier and Michael Williamson, and of the members of my dissertation committee, Urton Anderson, Volker Laux, and Caroline Bartel. I am further grateful for the editor and the helpful comments of the two anonymous reviewers. I also thank Vicky Arnold, Jasmijn Bol, Tony Bucaro, Erin Burrell, Jongwoon (Willie) Choi, Jeremy Douthit, Harry Evans, Vicky Hoffman, Joseph Johnson, Lisa Koonce, Justin Leiby, Tracie Majors, Don Moser, Kari Olsen, Mark Peecher, Sue Ravenscroft, Marcy Shepardson, Ira Solomon, Matthew Sooy, James Smith, Nate Stephens, Aaron Zimbelman, the Accounting Writers' Accountability Group at Iowa State University, and workshop participants at the University of Texas at Austin, the University of Central Florida, Utah State University, the University of Illinois Urbana-Champaign, Oklahoma State University, Iowa State University, the University of Pittsburgh, and the University of Massachusetts Amherst for their helpful comments. I gratefully acknowledge support from the Institute of Management Accountants Doctoral Research Grant and the Eugene and Dora Bonham Research Fund.

E-mail address: thornock@iastate.edu.

http://dx.doi.org/10.1016/j.aos.2016.09.002
0361-3682/

1991; Bonner & Sprinkle, 2002; Sprinkle & Williamson, 2007; Hannan, Krishnan, & Newman, 2008; Christ, Emett, Summers, & Wood, 2012). The timing of when to communicate performance feedback is particularly relevant because it is often under the discretion of management and is likely to substantially influence key outcomes of learning and performance.

Second, prior research on the effect of feedback timing has largely shown that delays in feedback *hurt* performance and learning (Brehmer, 1995; Diehl & Sterman, 1995; Gibson, 2000). However, this research has generally conceptualized feedback timing as just a *time* difference before receiving feedback and has not taken into consideration the timing of different *phases* of a task, each of which have unique informational and psychological characteristics. In essence, the timing of feedback in the current study is less about the actual passage of time and more about the ordinal phase in the task in which feedback is given. Key phases in a multi-step task include the phase before implementing a decision, immediately following implementation of a decision, and sometime after implementing a decision. Given that prior research has omitted this key feature of feedback timing – that delays correspond to changes in the phases of a task – a fresh examination is warranted.

To accomplish this, I develop and test theory that posits an inverted-U relation between the timing of feedback and future performance, in which future performance increases in the delay of feedback up to a point (i.e., immediately following implementation of a decision) and then decreases with additional delay of feedback. When an individual performs a task in which learning is key to future performance, there are certain costs that the individual must incur in order to learn (i.e., learning costs). First, individuals must devote costly time and effort towards learning (Bonner & Sprinkle, 2002; Sprinkle, 2000). Second, individuals may need to incur additional psychological costs (e.g., apprehension, cognitive dissonance, reluctance, etc.) in order to learn (Edmondson, 1999; Gray & Cooper, 2010). The level of these costs (both perceived and real) is likely to fluctuate over the different phases of the task, causing the level of learning to also fluctuate.

When decision-quality performance feedback is provided before implementation of a decision, learning costs will be relatively high – comprised of time and effort costs to learn as well as costs of implementing a known failure. These latter costs include not only the opportunity cost of foregoing the benefits of an alternative action, but also include psychological costs of implementing the failure (i.e., proceeding down a known incorrect path) (Gray & Cooper, 2010). When feedback is provided immediately after implementing a decision, the learning costs are lower – comprised of only the cost of the time and effort devoted to learning. This higher level of learning costs for individuals given decision-quality feedback before implementing a decision will steer these individuals away from learning, resulting in lower future performance than for individuals given feedback immediately following the implementation of a decision. After implementation of a decision, increasing the delay before providing decision-quality feedback brings with it an added measure of complexity in order to learn (Anderson, 1982; Lewis & Anderson, 1985). This added complexity increases learning costs to the individual in both time and cognitive effort required (Iselin, 1988; Tuttle & Burton, 1999), resulting in less learning and lower future performance as the delay in feedback increases. Thus, theory suggests that future performance will be highest when performance feedback is provided immediately following the implementation of a decision because learning costs are relatively lower compared to when performance feedback occurs prior to implementing a decision or after an extended delay after implementation of the decision.

To test this theory, I use an experimental task to examine how the timing of performance feedback affects individual performance. Participants complete a series of mazes in each of two periods and are paid a performance-based wage. The mazes contain visual cues allowing participants to learn how to quickly navigate through the mazes in both periods. In the first period, feedback regarding the correctness of a directional choice (i.e., decision-quality feedback) is provided either 1) immediately after a directional decision but before implementing the initial directional decision (i.e., after no delay), 2) after a short delay, 3) after an intermediate delay, or 4) after a long delay. In the latter three conditions, participants must implement the initial directional decision. In the second period, this decision-quality feedback is no longer available.

I find support for an inverted-U relation between the timing of performance feedback and future performance. Specifically, participants given feedback after no delay in the first period perform significantly worse in the second period than those given feedback after a short delay. This performance difference is associated with participants given immediate feedback avoiding a necessary cost to learn by failing to proceed down known incorrect paths to gather additional information needed to learn the cue patterns contained in the mazes. Furthermore, I find that participants given feedback after extended delays following implementation of a decision in the first period perform increasingly worse in the second period than those given feedback after a short delay. Additional analyses support the interpretation that this performance difference is attributable to individuals failing to devote additional time and effort to learn as the complexity of learning in the task increases with a delay in feedback.

This study contributes to the performance feedback literature in two ways. First, this study provides insight into the effect of the timing of performance feedback in settings where the delay in feedback is accompanied by natural variations in the cost of learning. Second, this study contributes to the performance feedback literature by investigating how individuals respond to the receipt of feedback at various phases of a multi-step task (e.g., pre-/post-implementation of a decision). Understanding factors that affect individuals' use of performance feedback can help improve its use in organizations and in understanding the specific environments in which delayed performance feedback is harmful or helpful (Libby & Luft, 1993; Luft & Shields, 2010).

These findings can also inform managers and management accountants on the potential benefits and pitfalls of delaying decision-quality feedback, an action management can often control, for individual learning in multi-step tasks. This study highlights the need for managers to be cognizant of *when* in the phases of the task to provide decision-quality feedback, keeping in mind the fluctuating level of learning costs facing those tasked to learn. Feedback provided too early (i.e., before implementation of an initial decision) comes with an additional psychological learning cost (i.e., proceeding down a known "wrong" path) whereas feedback provided too late comes with an additional learning cost to process the increasing complexity associated with the delay.

The remainder of this paper is organized as follows: Section 2 describes the research setting to examine the effect of feedback timing on individual performance. Section 3 reviews the literature relating to learning costs, developing hypotheses stemming from this literature. Section 4 presents the experimental task and Section 5 presents the results of the experiment. In Section 6, I conclude and provide suggestions for future research.

2. Research setting

The setting in which I examine the effect of performance feedback timing is of particular importance to managers and