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Speed/accuracy decisions in task performance: Built-in trade-off or separate strategic concerns?[☆]

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Abstract

In four studies we show that participants' regulatory focus influences speed/accuracy decisions in different tasks. According to regulatory focus theory (Higgins, 1997), promotion focus concerns with accomplishments and aspirations produce strategic eagerness whereas prevention focus concerns with safety and responsibilities produce strategic vigilance. Studies 1–3 show faster performance and less accuracy in simple drawing tasks for participants with a chronic or situationally induced promotion focus compared to participants with a prevention focus. These studies also show that as participants move closer to the goal of completing the task, speed increases and accuracy decreases for participants with a promotion focus, whereas speed decreases and accuracy increases for participants with a prevention focus. Study 4 basically replicates these results for situationally induced regulatory focus with a more complex proofreading task. The study found that a promotion focus led to faster proofreading compared to a prevention focus, whereas a prevention focus led to higher accuracy in finding more difficult errors than a promotion focus. Through speed and searching for easy errors, promotion focus participants maximized their proofreading performance. In all four studies, the speed effects were independent of the accuracy effects and vice versa. These results show that speed/accuracy (or quantity/quality) decisions are influenced by the strategic inclinations of participants varying in regulatory focus rather than by a built-in trade-off. © 2003 Elsevier Science (USA). All rights reserved.

1. Introduction

One of the fundamental questions since the beginning of experimental psychology has been when and why people are fast or accurate (Woodworth, 1899). Across psychological areas, the so-called speed/accuracy trade-off or quantity/quality conflict has been of major concern. In cognitive psychology, it has inspired theorizing about motor performances (Fitts, 1954; Fitts & Peterson, 1964; Howarth, Beggs, & Bowden, 1971; Keele,

1968; Keele & Posner, 1968; Meyer, Abrams, Kornblum, & Wright, 1988; Meyer, Smith, & Wright, 1982; Woodworth, 1899; Zelaznik, Mone, McCabe, & Thaman, 1988). In developmental psychology it has, for example, been introduced as a diagnosticum for developmental coordination disorder (cf. Maruff, Wilson, Trebilcock, & Currie, 1999). In personality psychology, it has been used as an indicator for concentration and attention (cf. Brickenkamp, 1972), impulsivity and reflexivity (cf. Bush & Dweck, 1975; Dickman, 1985; Dickman & Meyer, 1988; Leung & Connolly, 1997; Salkind & Nelson, 1980), extraversion and neuroticism (Malhotra, Malhotra, & Jerath, 1989; Socan & Bucik, 1998), anxiety (Revelle & Leon, 1985), intelligence (Phillips & Rabbitt, 1995; Tucker & Warr, 1996), general processes involved in achievement orientation (cf. Miller & Vernon, 1997), information processing (Dunn, Vaughan, Kreuzer, & Kurtzberg, 1999), and specific disabilities and problems (Chabot, Petros, & McCord, 1983; Raesaenen & Ahonen, 1995; Snowling, Hulme, &

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Goulandris, 1994). Speed and accuracy have been investigated in the human resources area as well, with respect to supervisory monitoring (Brewer & Ridgway, 1998), selection of planning strategies (Josephs & Hahn, 1995), self-efficacy perceptions on sales performance (Lee & Gillen, 1989), computer menu structures (Sepaelae & Salvendy, 1985), the relationship between personality and faculty research productivity (Taylor, Locke, Lee, & Gist, 1984), and diverse leadership styles (Johnson, 1975).¹

Given the extensive interest in speed/accuracy decisions, it is surprising that the basic processes underlying these decisions are still poorly understood. Why are some people fast and why some accurate? Are those differences due to personality variables, situational variables, or both? Are there circumstances where people are both fast and accurate, thus optimizing task performance? The psychological literature generally treats speed/accuracy decisions as involving a built-in trade-off, people either trade speed for accuracy or vice versa. However, in this paper we want to go beyond the notion of built-in trade-off. We want to propose a self-regulatory account of behavior in speed/accuracy tasks. From our perspective, people can have different self-regulatory foci, either a promotion focus or a prevention focus, which involve *strategic concerns* that influence speed/accuracy decisions. Let us briefly describe regulatory focus theory (e.g., Higgins, 1998) from which the model is derived, and then delineate its implications for performance in speed/accuracy tasks.

Regulatory focus theory distinguishes between two kinds of goal pursuit that vary in regulatory focus concerns: concerns with attainment of aspirations and accomplishments (promotion focus), and concerns with attainment of responsibilities and safety (prevention focus). These distinct regulatory concerns can be emphasized either chronically or momentarily. To illustrate, employer–employee interaction can chronically emphasize goal pursuit with either promotion focus concerns or prevention focus concerns (see also Higgins, 1989). Employees in employer–employee interactions that involve a *promotion focus* experience pleasure when employers, for example, reward an employee by praising her creativity and encouraging the employee to seek opportunities to engage in rewarding activities. The employee experiences pain, when employers, for example, stop praising or when they ignore her achievements. The pleasure or pain from these interactions are experienced as the *presence or absence of positive outcomes*, respectively. The employers' messages are communi-

cated in reference to a state of the employee that does or does not meet promotion concerns, either “This is what I ideally like you to do” or “This is not what I ideally like you to do”, respectively. The regulatory focus is one of promotion, *a concern with advancement and accomplishment, hopes, and aspirations (ideals)*. Strategically, individuals with a promotion focus are eager to approach matches to a desired end-state (i.e., pursue all means of advancement).

Employees in employer–employee interactions that involve a *prevention focus* experience pleasure when employers, for example, train the employee to be alert to potential dangers or misbehaviors. The employees experience pain when employers, for example, yell at or punish the employee for being irresponsible or careless. Here, the pleasure and pain are experienced as the *absence or presence of negative outcomes*. The employers' messages are communicated in reference to a state of the employee that does or does not meet some prevention concerns, either “This is what I believe you ought to do” or “This is not what I believe you ought to do”, respectively. The regulatory focus is one of prevention, *a concern with protection and safety, duties, and responsibilities (oughts)*. Strategically, individuals with a prevention focus are vigilant to avoid mismatches to a desired end-state (i.e., careful to avoid mistakes).

According to the theory, momentary situations as well as chronic leadership styles can also temporarily induce either a promotion focus or a prevention focus on goal attainment. For example, feedback messages or task instructions can communicate gain/non-gain information (promotion focus) or non-loss/loss information (prevention focus).

A promotion focus and a prevention focus involve different motivational orientations. Whereas individuals in a promotion focus with their inclination to approach matches are *eager* to attain advancements and gains, individuals in a prevention focus with their inclination to avoid mismatches are *vigilant* to assure safety and non-losses. In signal detection terms (e.g., Green & Swets, 1966; Tanner & Swets, 1954), individuals in a state of eagerness from a promotion focus are motivated to ensure “hits” and ensure against errors of omission (i.e., a lack of accomplishment). In contrast, individuals in a state of vigilance from a prevention focus are motivated to ensure “correct rejections” and ensure against errors of commission (i.e., making a mistake).

These regulatory differences have been shown to influence performance in signal detection tasks. In recognition memory tasks for example, individuals in a promotion focus want to ensure recognizing a true target (i.e., want many “hits”) and ensure against omitting a true target (i.e., want few “misses” or errors of omission), thereby producing an overall inclination to

¹ Even though the given examples might seem different in various aspects, we believe that there are fundamental principles that drive them. It is our attempt in this article to identify fundamental principles that possibly work across those different domains.

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