



The longitudinal effects of peer feedback in the development and transfer of student teamwork skills[☆]



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ARTICLE INFO

Keywords:

Peer feedback system
Teamwork performance
Confidence providing feedback
Organizational citizenship behaviors

ABSTRACT

Building on prior work accounting for a maximum of three time points, this research explores the impact of repeated exposure (up to six times) to a peer feedback system on students' performance at school and work. Drawing on self-regulation theory, this study reports the longitudinal effects of peer feedback on student performance and confidence providing feedback using a within-subjects quasi-experimental field study with a matched comparison sample. Results suggest that repeated use of a peer feedback system offers improvements over time in business students' performance and confidence in providing feedback to peers, irrespective of student differences (i.e. prior teamwork skills). Furthermore, decline in peer ratings of performance over time of the matched comparison sample provide evidence against the maturation hypothesis. A positive effect on participants' on-the-job organizational citizenship behaviors was also identified; evidence that the performance gains from use of the peer feedback system in university extend to the workplace.

1. Introduction

Post-secondary education institutions are working to more effectively instill critical and employer-valued skills in their graduates. Regarding business schools, criticisms from accrediting bodies such as the Association of Advanced Collegiate Business Schools (AACSB, 2002; e.g., Livingstone, 2013), the popular business press (Navarro, 2008a), and the academic literature (Navarro, 2008b) have been leveled. For example, Hughes and Jones (2011) note the failure of higher education in equipping students with the soft skills necessary for future success at work, while a recent poll of employers by Hart Research Associates (2015) confirms that these skills are more important than students' majors in determining their success at work. Similarly, a recent study concluded that business schools must do more to generate workplace ready graduates (Greenberg & Nilssen, 2015). Amid further echoes of the importance of soft skills and the failure of schools in delivering on them (e.g., Andrews & Higson, 2008; Robbles, 2012), one challenge is identifying effective tools and techniques for instructors to support students' soft skills development (e.g., O'Neill et al., 2017).

One particularly important soft skill is the capacity to work effectively in teams. Teams have been associated with improved organizational performance and effectiveness (e.g. Applebaum & Blatt, 1994;

Guzzo & Dickson, 1996), and teamwork is an increasingly common workplace arrangement given the complexity, magnitude, and time pressures associated with modern projects and service models (Salas, Shuffler, Thayer, Bedwell, & Lazzara, 2015). This imposes interdependence, interaction, and the need for complementary skillsets in order to innovate, compete, and deliver high quality work (Boning, Ichniowski, & Shaw, 2007). It is therefore not surprising that a survey by the National Association of colleges and Employers found the ability to work in a team structure to be the most sought after skill of recent graduates by employers (Loughry, Ohland, & Woehr, 2014), though complex and difficult to teach (Waddock & Lozano, 2013). According to a McKinsey report, team effectiveness is highly dependent on the teamwork skills of individual members, concluding that “the soft stuff matters – and is hardest to get right” (Keller, Krut, & Malan, 2010, p. 4).

Drawing on self-regulation theory (Bandura, 1991; Butler & Winne, 1995), this study investigates the role of repeated exposure to a peer feedback system in addressing the soft skills gap in post-secondary education. In so doing, it contributes to prior work in three important ways. First, building on research identifying incremental gains up to three-time exposure to peer feedback, it investigates the benefit of additional exposure to determine whether additional use (up to six times)

[☆] This research has been funded by grants from the Social Sciences and Humanities Research Council of Canada to the first (grant no. 435-2016-1530) and second (grant no. 435-2014-0535) authors.

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of a peer feedback system at university continues to accrue gains, or whether these benefits stall, or even reverse from system-exposure fatigue. In line with research confirming the importance of external feedback to learning (Butler & Winne, 1995), and given that teamwork skills involve complex behaviors, additional exposure to feedback may be necessary to draw individuals to behaviors that require attention, which are then addressed through self-regulation. A matched comparison sample of first-time users of the system is employed to help address the potential confounding effect of maturation. Second, another important question addressed in this study is whether students benefit equally, regardless of their initial level of teamwork skills. Third, the extent to which team member effectiveness in university transfers to on-the-job organizational citizenship behaviors (OCBs) is considered, as this could further inform whether enhancing teamwork skills during post-secondary is worthwhile.

2. Literature review and hypotheses

2.1. Longitudinal effects of peer feedback on team member effectiveness

Research suggests that peer feedback can positively influence evaluators and evaluatees in both cross-sectional (Saavedra & Kwun, 1993; Villanova, Bernardin, Dahmus, & Sims, 1993) and longitudinal research (e.g., Brooks & Ammons, 2003; Brutus & Donia, 2010; Brutus, Donia, & Ronen, 2013; Dominick, Reilly, & McGourty, 1997; Drexler, Beehr, & Stetz, 2001; Druskat & Wolff, 1999; Erez, LePine, & Elms, 2002). However, not much is known about how persistent the effects are over time. The available evidence typically stems from two time points within the same team without a matched comparison sample (i.e., pre-post designs without a control group, with the exception of Brutus & Donia, 2010, and Brutus et al., 2013). If the effects are not persistent, peer feedback should be given to students only once or twice. If the effects are persistent, peer feedback might best be used on an ongoing basis. Using a matched comparison sample helps address limitations of previous studies by modeling previous peer feedback experience.

Peer feedback is likely to underscore the self-observation aspects of Bandura's (1991) self-regulation theory. This occurs by providing students with knowledge of performance-standard gaps, which are discrepancies between a reference value (i.e., self-perception) and comparator (i.e., peer rating; cf. Carver & Scheier, 1982). Performance-standard gaps emerge with any contrast between beliefs about one's own performance and feedback provided by peers. Self-regulation theory also emphasizes the need for the *regularity* of this feedback, whereby more frequent attention to feedback-standard gaps should encourage individuals to modulate their behavior and be more self-aware of their actions. Given the complexity of teamwork behaviors, it is likely that multiple iterations of self-regulation and feedback lead to increasing improvements and mastery of these behaviors. Indeed, Smither, London, and Reilly's (2005) meta-analysis reported stronger performance improvements after multi-source feedback that was readministered within, versus after, one year. Thus, administering feedback over multiple occasions seems important. Additionally, Bandura's (1991) concept of *informativeness* is emphasized through peer feedback, given that it uniquely communicates how one's behavior is viewed by others, which would otherwise be inferred or inaccessible. Through regularity and informativeness of feedback, performance-standard gaps are made salient, thereby encouraging self-observation and behavioral self-regulation.

H1. Repeated use of a peer feedback system will increase the effectiveness of students in teams as rated by other team members over six occasions.

2.2. Cumulative gains in confidence over time

In addition to student effectiveness in teams, it is expected that

repeated administrations of peer feedback would result in cumulative gains in students' confidence in observing, evaluating, and communicating feedback to their peers beyond that noted over three exposures to peer feedback (cf. Brutus et al., 2013). Each additional administration of peer feedback (giving and receiving feedback) could serve as a training opportunity for students to learn how to provide accurate and useful feedback, thereby making them more effective in these tasks in their roles of evaluators. Indeed, compared to novice users, experienced users of peer feedback systems appear to be more confident evaluators (e.g., Bernardin & Villanova, 2005; Brutus et al., 2013). Brutus et al. (2013) found this to be associated with providing specific and actionable feedback, which may be more helpful for skill development of ratees (DeNisi & Kluger, 2000; Kluger & DeNisi, 1996). One advantage of having a standardized peer feedback system is its focus on specific behaviors on which students become accustomed to providing and receiving feedback. With repeated uses over time, these behaviors should become increasingly familiar and easier to observe in others, in turn increasing students' ability to detect effectiveness levels and provide specific feedback on teamwork behaviors. Multiple administrations are expected to lead to cumulative increases in confidence because experience with teamwork and familiarity with the rating process takes time and practice.

H2. Repeated use of a peer feedback system will increase students' confidence with (a) observing, (b) evaluating, and (c) communicating peer performance.

2.3. Addressing the competing hypothesis of maturation

It is important to address the potentially confounding effects of maturation, where more senior students may be better at teamwork due to natural maturation, learning, and growth processes that occur through post-secondary. Thus, when tracking student peer ratings over the course of undergraduate education, maturation can explain growth rather than repeated use of a peer feedback system. Accordingly, for each student with experience using the peer feedback system, a matched comparison group of other students in that same course who had not previously used the system was identified (see Fig. 1). For example, at Occasion 3, each participant who was experiencing his/her third exposure to the peer feedback system was matched with other students in the same course who were experiencing it for the first time. If participants with previous experiences with the peer feedback system consistently score higher on peer ratings and confidence in providing feedback, then experiences with the peer feedback system likely explain these gains rather than natural maturation processes that occur during post-secondary (e.g., Brutus et al., 2013; Brutus & Donia, 2010).

H3. At each occasion (2–6), students who have had prior exposure to the peer feedback system will receive higher peer ratings of performance than students who have had no prior exposure to the system.

H4. At each occasion (2–6), students who have had prior exposure to the peer feedback system will have higher confidence with (a) observing, (b) evaluating, and (c) communicating peer performance than students who have not had prior exposure to the system.

Peer feedback ratings and on-the-job OCBs.

Note: Experienced group = same student across occasions; Matched comparison group = different student in each occasion.

Examining correlates of peer feedback ratings with on the job behaviors is important to determine whether development of teamwork skills transfers to on-the-job behavior. As business-school students major in various disciplines and move on to perform a myriad of jobs, a unified set of core in-role performance behaviors was not feasible to assess. Rather, organizational citizenship behaviors (OCBs) were considered because they are relevant to most jobs. Moreover, they

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