Learning from Many? Partner Exposure and Team Familiarity in Fluid Teams

In a wide variety of operational environments such as in-flight hospitality, police patrol, ambulance transport, and surgical procedures, teams are assembled and disbanded after short collaborations. In such fluid settings, more familiar teams, i.e., teams comprising individuals who have worked more often with each other, yield significantly better performance due to improved coordination and shared knowledge about the task at hand (Reagans et al., 2005; Huckman et al., 2009). The resulting recommendation to operations managers has therefore been to keep teams intact, to the extent possible (Huckman and Staats, 2013). In establishing these findings the literature has thus far not considered the potential benefits of being exposed to the working practices of multiple partners over time, despite existing theoretical arguments and experimental findings suggesting that changes in team membership can enhance creativity and problem solving (March, 1991; Arrow and McGrath, 1993; Choi and Thompson, 2005; Gruenfeld et al., 2000). Knowing whether being exposed to a diverse set of partners translates into improved operational performance in field settings and how those benefits compare with those of team familiarity can help managers decide on the optimal team composition (Huckman and Staats, 2013).

We are able to address this question using data on ambulance transports from the London Ambulance Service (LAS) involving new paramedic recruits. Generally, ambulance transports are conducted by teams of two paramedics. While senior paramedics usually have stable, long-term partners, new recruits are scheduled on a relief roster for the first two years of their service, which provides exogenous variation in their partner assignments. We introduce a measure for an individual’s prior partner exposure, using a Herfindahl index of an her cumulative experience over prior team members. This measure has a number of desirable properties. For example, exposure to new and useful knowledge is marginally decreasing as the number of interactions with a given partner or the total number of prior partners increases. Furthermore, this variable describes workers’ entire prior partner experience whereas team familiarity summarizes the cumulative prior joint experience with only the team at hand.

We expect the impact of prior partner exposure to depend on the type of operational process in which the workers are engaged. We formulate separate hypotheses for the effect of prior partner exposure on operational performance depending on the level of standardization of the process. The
patient pick-up process at the scene involves on-scene diagnosis, treatment and transfer to ambulance in a wide variety of physical, social, and emotional situations under limited guidelines. In a less standardized or divergent (Shostack, 1987) process such as this, workers are likely to rely on tacit knowledge and have considerable executional latitude in applying it. Consequently, they are likely to benefit from prior partner exposure as it offers them the opportunity to observe different ways to perform process tasks and choose the best among them. In contrast, the patient handover process at the Accident & Emergency department of a hospital involves communication of clinical information to a triage nurse using well-defined patient report forms and physical transport of the patient to an available bed across relatively uniform physical layouts. In a more standardized or routine process such as this, team members can rely on the standard operating procedures and are likely to only overrule those if they expect the useful knowledge they have gained by observing a diverse set of partners to substantially improve performance. As a result, the beneficial effects of prior partner exposure may start to manifest themselves only after individual team members have accumulated sufficient experience.

In line with the above hypotheses, we find that increased partner exposure of new recruits has a direct impact on scene time: a crew whose new recruit has had maximum partner exposure spends 15% less time (4.5 minutes over a baseline average of 30 minutes) at the scene as compared to one whose new recruit has a fully focused partner experience. The effect of partner exposure on handover time is moderated by cumulative individual experience of the new recruit: greater partner exposure is beneficial only once the total number of transports by the new recruit is greater than a certain threshold. Beyond this level of sufficient experience (equivalent to approximately 4 months on the job), a fully diverse partner experience reduces the handover time by 16% (2.6 minutes over a baseline average of 16 minutes) compared to a fully focused partner experience. These results correspond to shortening activation times by almost 2 minutes on average by increasing the partner exposure of new recruits by one standard deviation. Apart from improved efficiency, reductions of this magnitude can also lead to significant improvement in health outcomes for time-sensitive conditions such as heart attacks, strokes and trauma injuries (Sacco et al., 2005; Bradley et al., 2006), which comprise approximately 20% of the ambulance transports in our dataset.

Additionally, we show that, at least in our empirical setting of new paramedic recruits, the beneficial impact of partner exposure is amplified at times of high individual workload. Specifically, we observe that operational performance is generally improved at times when the paramedics are
experiencing high workload and that the performance of new recruits with higher partner exposure improves more than that of their counterparts.

Our analysis also confirms previously identified benefits of team familiarity in our empirical context. Thus, a manager striving to optimize team formation and crew scheduling strategies must trade-off the beneficial effects of these two mechanisms. To obtain insight into this trade-off, we construct and analyze two illustrative counterfactual scenarios corresponding to two contrasting team formation strategies. The first, a partner focus strategy, assumes that new recruits are assigned a single stable partner for all transports whereas the second, a partner exposure strategy, assumes that new recruits take turns working with every senior paramedic at their location. Our results indicate that a scheduling strategy favoring partner exposure would outperform one favoring team familiarity by about 7%.

References


