



# Peer pressure and productivity: The role of observing and being observed<sup>☆</sup>



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## ABSTRACT

Peer effects arise in situations where workers observe each others' work activity. In this paper, we disentangle the effect of observing a peer from that of being observed by a peer, by setting up a real effort experiment in which we manipulate the observability of performance. In particular, we randomize subjects into three groups: in the first one subjects are observed by another subject, but do not observe anybody; in the second one subjects observe somebody else's performance, but are not observed by anybody; in the last group subjects work in isolation, neither observing, nor being observed. To assess the importance of payoff externalities in the emergence of peer effects, we consider both a piece rate compensation scheme, where pay depends solely on own performance, and a team compensation scheme, where pay also depends on the performance of other team members. Overall, we find some evidence that subjects who are observed increase productivity at least initially when compensation is team based, while we find that subjects observing react to what they see when compensation is based only on own performance.

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## 1. Introduction

In a recent survey of the insights for labor economics obtained in the lab, [Charness and Kuhn \(2011\)](#) define “pure” peer effects as applying to “a situation where workers work, side by side, for the same firm but do not interact in any way (except that they observe each others' work activity)” (p. 205). An example of such a situation is the real effort experiment by [Falk and Ichino \(2006\)](#), in which subjects work in pairs and each subject can see what the other is doing and at the same time knows that the other subject is seeing what she is doing, that is, a worker is both observing and being observed. [Kandel and Lazear \(1992\)](#) underline that observability plays a central role for peer pressure. They distinguish between internal pressure (or guilt) and external pressure (or shame), with observability being the discriminant between the two, as “[a] worker feels shame when others can observe his actions. Without observability, only guilt can be an effective form of pressure” (p. 806). These two feelings can also be present in settings with anonymous interaction, as discussed in [Ellingsen and Johannesson](#)

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(2008). The distinction between observing and being observed is also prominent in the work of Mas and Moretti (2009). They use data from a supermarket chain and exploit the spatial orientation of the cash desks to provide evidence that the positive productivity spillovers due to the introduction of highly productive cashiers into a shift come from other workers being observed by a high productivity worker and not from observing one.<sup>1</sup>

The aim of this paper is to advance our understanding of the behavioral mechanisms behind peer effects by disentangling the contribution of these two channels of peer pressure: observing a colleague's work and being observed by a co-worker. We do this in an anonymous setting where, unlike in Mas and Moretti (2009), there are no social interactions among workers outside the experiment, thus measuring "pure" peer effects as defined above. The advantage of an anonymous setting is that it allows us to understand whether peer effects emerge out of the mere observation of someone else's work or by the mere knowledge that someone else is observing our work, without the confounding effect of some unobserved interaction that may be taking place in the background. Indeed, with ongoing social interactions, peer effects could emerge out of strategic considerations, while in our setting only the behavioral mechanism is active. The presence of an ongoing relationship is particularly important in Mas and Moretti (2009), as in their setting there are also externalities among workers. Externalities are of course empirically relevant, but not ubiquitous, and, to assess their importance for the emergence of peer effects, in this paper we implement two treatments, with and without payoff externalities.

We take the standard setting used to study peer effects, that is, we have subjects perform a computerized task and place the digital equivalent of a "one-way mirror" between them so that only one side can see what the other is doing. In particular, in our experiment subjects work on the slider task developed by Gill and Prowse (2012a). After two rounds in which we measure baseline productivity, we randomly split subjects into three treatments. Subjects in the *Control* treatment do not observe and are not observed by anyone. The rest of the subjects are in treatment *Observed*, in which their performance is observed by another subject, or in treatment *Observer*, in which they observe another subject's performance. These roles are kept for the remaining 14 rounds, with the pairs of Observer–Observed rematched in each round using a random matching protocol. Notice that the only difference between the Control and Observed treatments is that someone is anonymously observing the performance of those in the Observed treatment. By comparing productivity in these two treatments, we can establish what is the impact of being observed by a peer. Moreover, we can identify whether observing another subject's performance has an impact on own performance. To do this, we look at whether what they observe has an impact on productivity of those in the Observer treatment. The fact that those in the Observed treatment never receive information about anybody else's performance means that in our design there is no reflection problem (Manski, 1993).

Regarding what to expect in terms of impact, the literature suggests that peer pressure can have both a positive and a negative effect on productivity. The worker observing might try to conform to high performers and raise effort (Bernheim, 1994) or feel discouraged by them and hold back from really applying themselves. Both types of effect are found in the literature on performance feedback. Performance feedback is closely related to our Observer treatment, but not necessarily the same, as in our setting subjects actually observe the working activity of their peers in real time and thus receive information not just about their performance, but also about their working process and effort. In this literature, papers like Bellemare et al. (2010) or Barankay (2012) find a discouragement effect, while studies like Delfgaauw et al. (2013), Blanes i Vidal and Nossol (2011) find positive effects. Both Beugnot et al. (2013) and Eriksson et al. (2009) have a treatment where feedback is provided in a continuous way, thus more closely resembling workers working side by side. In the treatment with continuous feedback, the first study finds positive peer effects for men, while the second study finds evidence of a negative effect on quality, but not on quantity. Both positive and negative forces can also be at play for observed subjects who might feel ashamed if they put too low effort or might internalize their impact on observers and refrain from working too hard or might even under-perform due to a "choking under pressure" effect (Baumeister, 1984; Ariely et al., 2009). What type of motivation prevails within each condition is, therefore, an empirical question and in the conclusions we will discuss how our results relate to the findings of some of the papers introduced above.

As mentioned, we start by distinguishing the role of observing and being observed in a pure peer effects setting, where compensation is on the basis of a piece rate, so there are no payoff externalities across workers. We then extend the analysis to consider peer effects when compensation depends on team performance. In this way, we can assess the importance of payoff externalities in the emergence of peer effects, with the expectation that peer effects are stronger when compensation is interdependent across subjects, as in the analysis by Kandel and Lazear (1992).<sup>2</sup>

When looking at overall performance, we do not find evidence of peer effects. This suggests that pure peer effects may be rather weak and that peer effects may emerge in the field only when embedded within a richer social context, though even in the field peer effects are far from being pervasive (e.g. Waldinger, 2012). When focusing on performance in the

<sup>1</sup> Another paper highlighting the effect of being observed is Corngnet et al. (2013). They allow all subjects to split their time between work, leisure and monitoring (observing others remotely). They find that when subjects are aware of when they are monitored, performance under team incentives increases to the same level as under individual incentives, while this is not the case when subjects are only aware of the possibility of being monitored. Note that unlike in our design, here the roles of observer and observed are not exogenously assigned, as all subjects can monitor and be monitored by their peers.

<sup>2</sup> In a recent and related paper, Babcock et al. (2012) compare individual and team incentives in a pay-for-studying experiment. In their setting, there is no free riding, as both team members need to reach a certain performance threshold for a bonus to be paid. The randomly assigned teammate could be either known or anonymous. They find strong positive effects on performance of being assigned to a team with a known partner in the pay-for-study intervention. Individuals assigned to the anonymous team treatment performed about as well as the individual treatment despite a high risk of default by the counterpart. They also find smaller but similar effects in a pay-for-exercise experiment.

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