



Confidence enhanced performance? – The causal effects of success on future performance in professional golf tournaments



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ABSTRACT

This paper provides field evidence on the causal impact of past successes on future performances. Since persistence in success or failure is likely to be linked through, potentially time-varying, ability it is intrinsically difficult to identify the causal effect of succeeding on the probability of performing well in the future. We therefore employ a regression discontinuity design on data from professional golf tournaments exploiting that almost equally skilled players are separated into successes and failures half-way into the tournaments (the “cut”). We show that players who (marginally) succeeded in making the cut substantially increased their performance in subsequent tournaments relative to players who (marginally) failed to make the cut. This success-effect is substantially larger when the subsequent (outcome) tournament involves more prize money. The results therefore suggest that past successes provide an important prerequisite when performing high-stakes tasks.

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1. Introduction

The determinants of performance in different aspects of life constitute a key element within economics. As a consequence, economists have devoted considerable effort to quantifying the extent to which factors such as education, experience, effort, cognitive and non-cognitive skills, beauty and height affect performance in various contexts such as schools and labor markets. One possible mechanism through which many of these factors may affect the ability to perform demanding or complex tasks is by altering the individual's own perception of the ability to perform these tasks, i.e. through building confidence. One specific version of this mechanism is the idea of “hot-hand” effects in the world of competitive sports. In this paper we provide quasi-experimental field evidence on the effects of past successes on future performance.

A starting point for our analysis is provided by [Compte and Postlewaite \(2004\)](#) who postulated that there may be causal link from past successes on future performance through “confidence”, defined as the perception of previous performances. Conceptually, consider two identically skilled surgeons performing identical surgeries where one patient dies and the other

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one survives due to random chance. Arguably, the surgeon whose patient died will think of the event as a failure, whereas the other will think of it as a success. The question is whether this difference in perception will have a causal impact on their performances in the future. There is so far very little credible field evidence on the empirical relevance of this fundamental idea. A likely reason for the scarce set of previous evidence on the issue is that it is inherently difficult to analyze since those that perform well today also may perform well tomorrow, and vice versa, simply because more able individuals are likely to persistently perform better than less able individuals.

In this paper we use data from professional golf tournaments, relying on a special feature in these tournaments enabling us to perform a regression discontinuity (RD) analysis to identify the causal impact of succeeding in one tournament on the performance in the next.¹ Midway through most of the professional golf tournaments on the European PGA Tour there is a qualification threshold (the cut) that a player must pass (make) in order to complete the tournament and earn prize money. Players around the threshold have performed almost equally well but, arguably, when the players look back on their performance, those who barely passed will have a perception of success whereas those who barely failed will have a perception of failure. By studying the results in the subsequent tournament we are able to isolate the effect of present success on future performances.²

Empirically, we are perhaps closest in spirit to the study of “hot-hand” effects within sports economics, i.e. the notion that athletes’ performances during certain (short) periods are significantly better than otherwise; see e.g. [Livingston \(2012\)](#) and [Clark \(2005\)](#) for two examples using data from golf tournaments, [Abrevaya \(2002\)](#) for an example using data from bowling tournaments, [Crust and Nesti \(2006\)](#) for a wider review of the phenomenon and [Rabin and Vayanos \(2010\)](#) for a theoretical discussion. We do, however, provide two novelties relative to the existing hot-hand literature. Firstly, we look at a longer time interval (a week) between subsequent performances and thus we are able to study effects that go beyond the immediate state of mind. Secondly, instead of only following the performance of an individual player over time we can control for the counterfactual development (i.e. the player in a failure state) and thereby reduce the confounding impact of exogenous time-varying but persistent factors that may affect the players. Thus, we believe that we are more likely to be able to detect a causal “hot-hand” relationship than previous studies.³

The previous literature also contains a number of studies where the assignment to success and failure is manipulated in a controlled laboratory setting. Most of these studies find that (perceived) successes tends to improve subsequent performance while (perceived) failures deteriorate future performance, see, e.g. [Gill and Prowse \(2012, 2014\)](#) and [Bélanger et al. \(2013\)](#) for a recent review. A number of relatively recent studies have also examined the importance of *relative* feedback information on subsequent performance, finding mixed results. [Azmat and Iriberry \(2010\)](#) and [Tran and Zeckhauser \(2012\)](#) both report that when individuals in a group receive information about their relative performance ranking in the group, the group as a whole performs better in the future. Since they find improvements in subsequent performance over the whole distribution, the results suggest that relative feedback information spurs a general will to compete. [Eriksson et al. \(2009\)](#), on the other hand, find no general effect from relative performance feedback but instead document a reduction in the quality of low performers’ work. Along the same lines [Murphy and Weinhardt \(2013\)](#) find that students in English primary schools are sensitive to their local rank. They compare equally able students (same score on a standardized national test at the end of primary school) that differ with respect to their local rank. Students in the top of the performance distribution at their school outperform students with poor local rank in secondary school even though they had the same test score.⁴

A key difference between these studies and our set-up is that we isolate the impact of success in a setting where the subjects are fully informed regarding the underlying process, once success or failure has been determined. Players know how many strokes they used, what their final rank became, and whether they passed the cut or not. Thus, scoring one stroke less to pass the cut is not more informative regarding the own ability than scoring one stroke less to get closer to (or further from) the cut.⁵

To preview our results, we show that players just above and below the cut indeed are comparable in terms of predetermined characteristics allowing us to infer the causal impact of the initial success on future outcomes. We further show that making the cut in a tournament has a large and statistically significant positive causal effect on the outcomes in the subsequent tournament. The number of strokes after two rounds falls by a quarter of a stroke and the probability of making the cut in the following tournament increases by 3 percentage points from a baseline of 50 percent. This is a sizable effect in relation to the importance of other variables in the data such as years of professional experience and the average score per round the previous year.

¹ In using data from the world of sports to study fundamental economic processes we follow in a long line of previous papers. [Ehrenberg and Bognanno \(1990a, 1990b\)](#), [Orszag \(1994\)](#) and [Melton and Zorn \(2000\)](#) all use data from golf tournaments to study the predictions of tournament theories and [Pope and Schweitzer \(2011\)](#) use data from golf tournaments to measure loss aversion.

² Making the cut improves the ranking of a player compared to failing to make the cut; but this ranking has, unlike in some other sports (e.g. tennis), no direct benefits in the upcoming tournament.

³ See [Wardrop \(1999\)](#), [Frame et al. \(2003\)](#) and [Bar-Eli et al. \(2006\)](#) for discussions regarding difficulties when attempting to estimate hot-hand effects.

⁴ A related literature studies the importance of “stereotype effects”, where subjects’ performance on tests are found to be affected by information regarding the average performance among people with similar characteristics as themselves, see e.g. [Cadinu et al. \(2003, 2005\)](#) and [Aronson et al. \(1999\)](#).

⁵ Notably, [Compte and Postlewaite \(2004\)](#) show that it can indeed be rational to have biased recollections of previous performances as long as performance is directly affected by (the perception of) previous performances.

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