

Which Entrepreneurs are Coachable, and Why?

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Advice and mentorship is a fundamental part of startup accelerators and incubators. With uncertain firm quality, founders' ability to work closely with early investors and other partners - that is, their coachability - has long been considered critical (e.g., Timmons and Bygrave (1986)).

Measuring coachability, however, is a very difficult task, as it depends on both the entrepreneur's actions *and* their skills. Consider a firm that does not follow up on a suggestion in a particular area from an expert mentor. If the firm does not possess capabilities in that area, the rejection is likely due to overconfidence-driven uncoachability (Cassar (2010)). However, if the firm does have knowledge in the area, then it may be rejecting a suggestion after careful, rational consideration. The precise capabilities and "local knowledge" of a founding team may be very difficult for outsiders to observe (Bengtsson and Hsu (2015)). Since entrepreneurs may appear uncoachable either because they are rational or stubborn, the potential for analysts, investors, or grant agencies to identify "real coachability" may be limited. For instance, if Steve Jobs rejected advice on product design in 1980, is he overconfidently stubborn, or rationally using that advice alongside his own (hard-to-observe) skill set?

Therefore, if coachability is to be a useful concept, there must be differences in real coachability across firms, these differences must predict differences in startup performance, and it must be possible to separate real coachability from rational Bayesian information use using only the limited data typically available to outsiders. Using a novel dataset tracking how early-stage en-

trepreneurs respond to specific, actionable advice given to them by highly successful serial entrepreneurs, we argue that the concept of coachability as presently used is unlikely to satisfy those three criteria. Firm characteristics do predict observed coachability in line with anecdotal beliefs about which types of firms are hard to mentor, but observed coachability does not predict firm outcomes, and extensive founder background and task information does not suffice to distinguish tasks where founders are knowledgeable, and hence can reject advice rationally, from tasks where founders do not possess adequate background knowledge.

The existing rigorous literature on entrepreneur coachability is very limited. Howell (2016) shows, via business plan competitions, that the ability to improve a pitch is correlated with future success, that firms react with at least some rationality to outside evaluation, and that firms with a profit motive, as opposed to social or lifestyle motive, are more likely to respond. Yu (2016) shows that accelerators primarily speed learning about whether an idea is worth pursuing; given this role, the process by which firms acquire and act on outside knowledge is essential. We complement these papers by investigating more substantive advice, given to economically significant startups, from particularly well-informed outsiders, where that advice also contains rich qualitative discussion of why certain advice was or was not accepted.

I. Data

Our data comes from 470 applicant firms for the first four annual cohorts (2012-2015) of the University of Toronto's Creative Destruction Lab (CDL), of which 131 were accepted. These firms are largely based in Eastern Canada, although the sample includes firms based across Canada, the United States, and Europe. CDL is a

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university-based, selective, non-residential incubator for science-based, early-stage startups, structured as a series of meetings with an expert panel roughly every eight weeks, and is one of pure knowledge transfer.¹ Firms are generally accepted at a stage where they will try to raise seed capital within a year, hence most are bootstrapping at the time they enter the program; only 10.2% of applicants had raised more than CAD\$100,000 in seed money at the time of application. Accepted firms currently have a collective valuation, based on public capital raises and exits, of more than \$1.1 billion, and nearly half have either done a public raise valuing the firm at over \$1 million or have been acquired.

The expert panel's makeup varies by year, but has included multiple founders of "unicorn" firms with billion dollar valuations, C-suite executives from large technology companies, and partners at elite Silicon Valley venture capital firms. Before each meeting, panelists chosen for their match with the startup spends at least four hours in in-depth discussion with that firm. A set of milestones, generally three per meeting, are proposed by the firm and its mentors as tasks to focus on before the subsequent meeting. The panel as a whole then discusses the progress the firm has made and modifies the desired milestones. Milestones are required to be precise and actionable, and they are set in cooperation with the firms with the intent of being achievable if the firm prioritized those tasks. This advice is more substantive than what would be received at a pitch contest, business plan competition, or demo day: in multiple cases a firm completely changed its primary product following a panelist suggestion.² After each meeting, a handful of firms who prove poor fits for the knowledge base of their mentors are removed from the program. Voluntary attrition is extremely rare.

¹Unlike in an accelerator, no equity is given up by participants, and no payments are made. A complete description of the application process, selection, and structure of the lab is in the Online Appendix.

²These changes can be radical; in one case, a firm pivoted from a technology for growing indoor vegetables to a marijuana equipment supplier!

This data is unusual in five ways. First, we have complete information on outcomes for every founder of every firm that applied for the program, even for those firms that never incorporated and which are not visible in any public database. Second, the milestones are varied and substantive, permitting investigation of how mentees handle qualitatively different types of advice. Third, the firms are "real" in the sense that there are no lifestyle businesses, social enterprises, or part-time student firms. Fourth, there exists exhaustive qualitative data on precisely what each firm was doing during each eight-week interval, what was said about them by each mentor, and why the firm claims they were able or unable to achieve particular milestones. Fifth, the vast majority of firms were not part of other accelerators, nor was the CDL an investor.

Of the 131 accepted firms, 84 remain in the program for multiple meetings and hence have milestone completion data.³ These 84 firms are given 692 milestones, of which 391 are successfully achieved. Of the 301 milestones which are not completed, 132 are associated with comments suggesting either that the firm rejected the milestone as a short-term goal after some consideration, or else that they delayed achieving the milestone in order to focus on other tasks. Each milestone was hand-coded into categories which represent, at their most broad, tasks involving market validation (e.g., "Get X paying customers by date Y," "Secure an LoI from a major research hospital"), funding ("Revise pitchbook," "Raise \$100,000 by date Y"), technical tasks ("Implement data switching across mobile OSs," "Complete the mechanical designs for the prototype"), and other business tasks ("File a provisional patent application").

We use three measures of coachability. First, as milestones are explicitly set with the expectation that they can be achieved by a firm that prioritizes their completion, pure milestone completion serves as a measure of the extent to which firms prioritized the completion of tasks assigned by their

³Recall that after each meeting, firms are removed if no suitable mentor volunteers to continue mentorship.

mentors. There may be worry that milestone completion is correlated with ability in addition to coachability. We perform a number of checks to assuage this worry, with two of particular note. First, for the fourth cohort of firms we have pre-entry evaluation scores constructed by CDL’s evaluation team on the basis of a written application. This score is not correlated (Online Appendix Table 3) with the percent of tasks a firm completes. Second, as we will discuss while describing our results, milestone completion is negatively rather than positively correlated with multiple covariates that measure experience. We therefore use milestone completion as our primary measure of coachability.

As a second measure, note that firms describe some incomplete milestones as “in progress” or “will be completed soon,” while explicitly discussing why others were not pursued (often with a verbal discussion of why, after gathering further information, the milestone was delayed or rejected). Though every firm initially agreed to their milestones, after each meeting they gather information about the suitability of the task and its opportunity cost. Not completing a task is evidence that it was not prioritized highly enough by the firm, while challenging the task is evidence that the firm came to believe that the milestone was not critical in the short run. These challenges better separates ability from coachability in one sense, but since the outcome - milestone completed or not - is identical whether the milestone is said to be “in progress” or explicitly pushed to the back burner, this second measure may conflate coachability with an idiosyncratic preference for being upfront about why milestones were not achieved.

Third, we have to a very limited extent a direct measure of coachability. We hand-coded a set of 2,164 comments given to firms by mentors either verbally during panel meetings or later in writing. For 14 of the 84 firms in the primary dataset, there is at least one comment that explicitly refers to their coachability in a positive manner.⁴

⁴The Online Appendix contains a description of how

As firm-level covariates, we use the complete academic background of the founders of each firm, their ages and genders, the founding team size and firm employment size at the time of application, the existence of large capital raises before the program begins, and dummies for entrepreneurship history or high-level business development experience coded from the CVs of every founder. For outcomes, we have a measure of whether the firm was acquired or has had a public capital raise valuing the firm at more than \$1 million, the continued existence of the firm as measured by founder LinkedIn résumés and company websites, pivots as measured by a change in the firm’s name since application, the total number of public capital raises, and the total quantity of capital raised.

II. Results

Table 1 displays the relationship between firm and founder covariates and the probability of completing or challenging a milestone.⁵ There are large, robust, negative relationships between the average age of the cofounders and milestone completion, and between the size of the founding team and milestone completion. On the other hand, gender and prior experience do not predict coachability, and academic teams are, if anything, weakly more likely to achieve milestones. The data on rejecting milestones is noisier, but again, large cofounding teams are more likely to challenge their mentors, although firms with many employees are less likely to do so.⁶ Despite the noise, large effects of gender, business experience, or academic background on “coachability” can be ruled out.

Mentor comments show an understanding that age and team size can affect how firms act on advice, and that there are cases

“coachability” was coded, as well as a complete data dictionary for the variables discussed in this paper.

⁵All results in the main paper are shown via linear regression. The Online Appendix shows that qualitative relationships remain under probit or other nonlinear functional forms.

⁶Note that these results are not consistent with milestone completion merely being a proxy for underlying ability, which ought to be higher for older or larger teams.

TABLE 1—HOW FOUNDER/FIRM PROPERTIES AFFECT COACHABILITY

| (Dep. Variable) | [1] Completed | [2] Completed | [3] Challenged | [4] Challenged |
|-------------------|-----------------|-----------------|----------------|----------------|
| Avg Founder Age | -.014 (.005)*** | -.014 (.005)*** | .004 (.004) | .004 (.004) |
| # of Founders | -.056 (.019)*** | -.057 (.019)*** | .040 (.015)*** | .043 (.015)*** |
| # of Employees | .002 (.011) | .002 (.011) | -.017 (.008)** | -.017 (.007)** |
| Bizdev Experience | .001 (.046) | -.041 (.062) | -.023 (.038) | .026 (.052) |
| Prior Startup | .018 (.055) | .009 (.062) | -.055 (.039) | -.076 (.043)* |
| PhD Degree | .082 (.054) | .080 (.056) | .002 (.040) | .023 (.040) |
| Female Founder | -.029 (.059) | -.029 (.058) | -.032 (.047) | -.028 (.046) |
| Technical Match | | .002 (.102) | | -.106 (.081) |
| Bizdev Match | | .090 (.086) | | -.116 (.069)* |
| Entrep. Match | | .020 (.095) | | .088 (.086) |

Notes: OLS estimates with standard errors clustered at the firm level; 692 total observations. Dependent variable is a binary representing whether a milestone was completed [1,2] or challenged [3,4]. All regressions control for the firm's cohort in CDL, their "track" if the firm is in the special machine learning program, and the type of milestone assigned (e.g., "Funding", "Market Validation").

where firms either accept advice too easily or reject it too quickly.. Of a young team, a mentor argued, "they are getting a lot of advice and direction from a number of different communities which could start to distract a young founder/CEO," implying excessive malleability. Alternatively, about an experienced founder, "the biggest concerns regarding this venture are commitment and coachability...C is an established prof at [Canadian university] but this is a significant passion project for him," implying potential stubbornness. Likewise, big founding teams were seen as beneficial when they held broad knowledge, but harmful if they led to overconfidence.

To separate stubbornness from rational use of information, we code tasks as "matched" to founder background.⁷ Rational founders should be less likely to complete and more likely to challenge milestones, as their private information is more likely to inform whether milestones are worth prioritizing. However, if most founders are stubborn, they should be less likely to complete milestones, and more likely to challenge them, even without expertise in a given area.

Columns 2 and 4 of Table 1 show that

⁷We match technical tasks to firms with PhD founders, HR and market validation tasks to firms with previous entrepreneurs, and HR, funding, alliance/partnership, business planning, and market analysis tasks to firms whose founders have an MBA or high-level business development experience.

"matched" milestones are not less likely to be completed, nor more likely to be challenged.⁸ These results are consistent either with older and larger teams being more stubborn, conditional on founder background, or with our measurement of "experience" in a given area being imprecise. Note, however, that our measures of the background knowledge of firms includes full CVs, educational backgrounds, previous startup experience, and self-reported descriptions of the exact tasks founders performed at their previous firms. That is, we can condition on the kind of information funders or government agencies can when evaluating whether failure to take advice is rational or stubborn.

Whether or not uncoachability reflects rationality or stubbornness, to the extent that *observed* coachability matters, it should be visible in outcomes. We first construct a standardized measure of milestone completion relative to what the average firm would do given tasks of the same "type".⁹ Table 2 regresses this milestone completion measure on whether the firm had a positive outcome (the firm was acquired or had a pub-

⁸Online Appendix Table 4 shows that in a fully interacted model, matched tasks are less likely to be completed by older teams, and large founding teams are no more or less likely to complete tasks.

⁹This measure essentially controls for the varying difficulty of completing some tasks; see the Online Appendix for details.

TABLE 2—HOW COACHABILITY PREDICTS OUTCOMES

| (Dep. Variable) | [1] Pos. Exit | [2] Resolution | [3] Still Active | [4] New Name |
|----------------------|---------------|----------------|------------------|--------------|
| Std. Completion Rate | .036 (.057) | .021 (.060) | .012 (.037) | -.037 (.050) |
| Avg Founder Age | .000 (.012) | .006 (.013) | -.007 (.008) | -.005 (.010) |
| # of Founders | .054 (.055) | .065 (.058) | -.004 (.036) | -.021 (.048) |
| # of Employees | .047 (.029) | .065 (.030) | -.025 (.019) | -.030 (.025) |
| Bizdev Experience | -.221 (.116)* | -.178 (.122) | -.026 (.076) | -.074 (.101) |
| Prior Startup | .131 (.124) | -.006 (.130) | .137 (.081)* | .055 (.108) |
| PhD Degree | .061 (.127) | -.044 (.133) | .120 (.083) | .049 (.111) |
| Female Founder | -.136 (.124) | -.089 (.131) | -.104 (.081) | -.095 (.108) |
| Capital Before CDL | .141 (.137) | -.128 (.144) | .044 (.089) | .047 (.119) |

Notes: OLS estimates; 84 total observations. Dependent variable is a binary representing whether a firm was acquired or had a public capital raise with a valuation over 1 million dollars [1], either had one of those positive outcomes or was shut down [2], is still an active firm [3], or “pivoted” as measured by ever changing their name [4]. All regressions control for the firm’s cohort and track in CDL. “Std. completion rate” is the percentage of milestones completed by firm, adjusted for task mix, demeaned and standardized, and “Capital Before CDL” is a binary equal to 1 if firm had CAD\$100,000 or more of capital before CDL began.

lic capital raise valuing it at over \$1 million), is still in business, “resolved uncertainty” by either having a positive outcome or going out of business (as the “fast fail” method suggests startups ought to do), or pivoted their business model (as measured by name changes). Coachability is not correlated with any outcome, and the point estimate is that a one standard deviation in coachability improves the probability of a successful exit by only 3.6 percentage points on a base of 35 percent.¹⁰

These coachability results are not terribly surprising in one sense. Online Appendix Table 6 shows that, among all 470 applicant firms, founder age and team size have a zero or weakly positive effect on positive outcomes, yet both factors strongly predicted non-coachability. Analogously, other information reflecting background knowledge of the firm, unobservable either to us or to an analyst proclaiming that a firm is “uncoach-able”, may conflate advice receptivity and underlying firm ability.

III. Conclusion

Mentorship surely matters. Overconfidence surely exists. That said, separating an uncoachable team from a well-informed one requires a great deal of information about the latent capabilities of that team.

¹⁰Online Appendix Table 5 shows positive coachability comments also do not predict positive outcomes.

Teams that are more likely to follow advice are not more likely to succeed. Background information on firms, more extensive in our data than what many early investors or grant agencies possess, cannot separate advice neglected because the startup has strong background knowledge on a topic from that neglected due to stubbornness.

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