

Bureaucratic Professionalization is a Contagious Process Inside Government: Evidence from a Priming Experiment with 3,000 Chilean Civil Servants

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Abstract

Education is central to theories of how bureaucracies professionalize. Going back to Weber, the process towards a capable and professional bureaucracy has been viewed as driven by the entry of well-educated, professional recruits. We argue that this perspective misses important dynamics within professionalising bureaucracies – in particular how bureaucrats inside government react when bureaucracies professionalize. Building on this insight, we argue that incumbent bureaucrats face incentives to acquire greater expertise when educated entrants arrive, in order to remain competitive for organizational rewards (such as promotions) inside government and jobs outside government in case educated entrants "outcompete" them. We provide empirical support for these propositions with a priming experiment with 3,000 bureaucrats in Chile's central government. Bureaucrats primed about the professionalization of other bureaucrats put a greater premium on their own expertise acquisition. Our findings suggest that bureaucratic professionalization is a contagious – and thus self-reinforcing - process inside government.

Evidence for practice

- Merit recruitment practices can professionalize not just new recruits but also the existing workforce: civil servants face incentives to upskill in response to the entry of educated newcomers to remain competitive for organizational rewards (such as promotions) and outside jobs
- Civil servants with attractive outside employment options are less susceptible to this effect.
- When implementing professionalization processes, reformers need to consider how the existing workforce will react and how internal and external labor markets for civil servants will be affected

Introduction

Education is essential to state development. Among the core reasons for this is the role education plays in the professionalization of bureaucracies, the development of state administrations into meritocratic, impartial, and effective bureaucracies, as envisioned by Max Weber (1978). Educational requirements for bureaucratic entry were core to the development of state apparatuses throughout history (Fukuyama 2011). Educated recruits played central roles in turning often corrupt and incompetent 17th and 18th century royal administration onto the path to well-functioning bureaucracies (Silberman 1993; Jensen 2017; Ertman 1997). Beyond historical cases, the development of well-functioning pockets of bureaucratic expertise from Singapore decades ago (Klitgaard 1988) to Ghana today (McDonnell 2020) is frequently ascribed in part to the entry of well-educated recruits.

Yet, how skills development among already employed bureaucrats – rather than the arrival of educated new entrants – shapes the development of professional bureaucracies has not taken center stage in theories of professionalization. This is, both theoretically and practically, an important omission. The share of high-skilled jobs is increasing across public and private sectors, emphasizing the need for continuous workforce upskilling (World Bank 2019) in a context of increasing automation and complexity of public sector tasks (cf. OECD 2016). While longstanding scholarship on the upskilling of public sector staff exists (see, e.g. Carnevale and Carnevale, 1993), theories of state professionalization are curiously silent about in-house expertise development.

This article addresses this gap. We ask: how does the entry of educated newcomers – a core component of civil service professionalization – affect the upskilling behavior of incumbent (already employed) bureaucrats? We argue that the entry of educated newcomers incentivizes incumbent bureaucrats to develop expertise (or upskill; we use these terms interchangeably). The core driver is bureaucratic ambition (Teodoro 2011). As education levels rise among newcomers,

incumbent bureaucrats are incentivized to develop their own expertise to be able to compete for organizational rewards, such as promotions, and increase their value to potential future outside employers in case they become "outcompeted" inside government by educated newcomers.

Incentives in the public sector, of course, have their limits in motivating employee behavior (cf. Dixit, 2002; Esteve and Schuster, 2019). As such, this argument has more sway in position-based systems with competitive promotions rather than career systems with seniority-based promotions. With this in mind, we provide evidence for our arguments through a survey experiment with over 3,000 civil servants in Chile's (position-based) central government. Exploiting a substantial increase in the share of university educated entrants into Chile's public service over time, we use an information prime to make civil service professionalization salient to public officials. As predicted, this information increases the importance respondents place on their expertise. Consistent with our argument, this effect is stronger among public officials without attractive outside employment options - i.e. who do not believe their career ambitions can be met outside the public sector.

Our findings suggest that professionalization is contagious. Professionalization begets professionalization, with educated entrants incentivizing upskilling of incumbent bureaucrats, creating a positive spiral of voluntarily undertaken human capital improvements in public service.

The role of education in bureaucratic professionalization

Bureaucracies face what Winterton refers to as a "workforce capability problem" (2008, 324-325): the challenge of matching the capacity of its personnel with the demands of its tasks now and in the future. How is human capital developed within public sector bureaucracies? The conceptual starting point is education as a way of accumulating human capital – the skills and knowledge that can be put to productive use (Teodoro and Switzer 2016, 565). Human capital on this view can be

bought (through recruitment of educated entrants) and/or grown (by upskilling employees). Education thus forms a core part of public sector human capital and expertise development, enabling employees to produce more for their organization than less human capital-endowed colleagues.

We build on two disparate literatures which contribute to our understanding of public sector human capital development: the public management literature on upskilling, and the public administration, political science, and sociology literatures on state professionalization. As we shall argue, neither of these literatures pays attention to how civil servants react when their colleagues become more educated.

Scholars of public sector human resource management and civil service systems frequently refer to the importance of staff development (e.g. Berman et al. 2017; Wise 1996; Llorens, Klingner and Nalbandian, 2018), and study, for instance, the effects of supplying training and on-the-job education (e.g. Owens 2006; Chen et al. 2021). Upskilling, however, not only depends on the supply of training and education, but also the demand-side for education: the decision among employees to pursue upskilling. Studies of “endogenous expertise development,” in particular, have paid attention to this demand-side (Gailmard and Patty (2007, 2012) As in our theory, they treat upskilling as a strategic, incentive-based decision for public officials. Gailmard and Patty (2007, 2012), for instance, argue that officials decide to develop expertise when given discretion and relative job protection. Carpenter (2001) in turn has pointed to the build-up of expertise as government agencies professionalized as part of coalition building strategies to gain autonomy. Conversely, scholars have pointed to political appointees' disincentive to professionally develop and upskill as a reason for why political appointments harm performance (Lewis 2008) and stifle innovation (Lapuente and Suzuki 2020). None of these studies, however, have paid attention to how bureaucrats react when their colleagues become more educated.

The second literature we build on focuses on bureaucratic professionalization (see, e.g., Grindle 2012; Silberman 1993, Ertman 1997). Much of this, often historical, literature ties bureaucratic professionalization and education to meritocratic recruitment. Merit recruitment enables professional and educated state administration, as bureaucrats are no longer selected based on non-merit criteria (such as political connections instead of professional expertise) as in patrimonial administrations (Grindle 2012). Socialization into an *esprit de corps* among educated merit recruits further reinforces professionalization (Weber, 1978). However, this professional socialization is sketched as taking place *between educated recruits* (McDonnell 2020). To quote Lange and Rueschemeyer (2008, 8): "Meritocracy, while obviously enhancing effectiveness, also promotes a special kind of group coherence that strengthens organizational autonomy" (see also Rauch and Evans 2000). This focus on the education of entrants proliferates throughout the bureaucratic professionalization literature (cf. Silberman, 1993; Ertman, 1997).

At the same time, the bureaucratic professionalization literature has – like public management studies of upskilling and endogenous expertise development – not assessed how bureaucrats respond to the professionalization of *other* bureaucrats. Yet, peer effects in public sectors may matter (e.g. Brown and Laschever, 2012). As we shall argue next, the desire to acquire expertise may depend on the acquisition of expertise among new entrants. Conterminous human capital growth matters and may lead to a contagious effect of new entrants on existing human capital.

A theory of contagious professionalization

To build our theory, we integrate theories of bureaucratic ambition with concepts from organizational and labor economics, to connect bureaucratic professionalization, particularly the entry of educated recruits, to further professionalization: professionalization incentivizes expertise

acquisition among incumbent bureaucrats due to competition for organizational rewards and the potential for capability signals to possible outside employers. As a boundary condition, we expect this effect to be weaker among bureaucrats who believe their external signals are "saturated" in the sense that they can already signal ability to outside employers.

Our argument starts from the notion that bureaucrats are responsive to career incentives. Bureaucrats develop expertise, even if doing so is costly, to further their career. As far as incentives within organizations go, this is hardly a controversial claim (for recent evidence see e.g. Bertrand et al. 2020; Karachiwalla and Park 2017). Following the literature on career incentives in public entrepreneurship (e.g. Teodoro 2011; Teske and Schneider, 1994) and classic models in labor economics (Lazear and Rosen 1981; Waldman 1984), we, further, posit that career incentives for bureaucrats operate between organizations and sectors as well as within them.

In particular, in his theory of bureaucratic ambition and policy entrepreneurship, Teodoro (2011) notes two stereotypical career paths shaping the behavior of ambitious bureaucrats. "Ladder" careerists seek to move up within their organization; their upskilling ambitions are shaped by internal labor markets. "Ramp" careerists instead seek outside options, advancing their career through moves between organizations; their upskilling ambitions are shaped by external labor markets. We structure our argument around these two strategies.

Organizational rewards for 'ladder careerists'

To understand upskilling incentives of ladder careerists, we turn to tournament models for advancement in internal labor markets (cf. Lazear and Rosen 1981). Similar to classical principal-agent models in public administration research (cf. Miller 2005), such models consider organizational rewards where managers cannot observe output, such that effort cannot be directly incentivized. In such contexts, rewards can instead be distributed through rank-order tournaments.

In principal-agent parlance, a principal of agents can have them compete against each other for organizational rewards to induce effort.

Core to this idea is that "production" in Lazear and Rosen (1981) is a function of both hard work and ability. In our setting: If bureaucrats compete for organizational rewards allocated as prizes in rank-order tournaments, acquiring expertise to enhance ability is part of the strategy bureaucrats use to pursue those rewards (Wise 1996). If a set of newcomers to the tournament have higher ability, existing participants are incentivized to acquire expertise to enhance their ability and compete with the newcomers for tournament rewards. When bureaucracies professionalize, the competition for organizational rewards stiffens, incentivizing incumbent bureaucrats to acquire expertise to retain access to rewards. Professionalization begets professionalization.

Though at first this logic seems foreign to public bureaucracies, many organizational rewards in these organizations are distributed as rank-order tournaments. Promotions in particular are prizes which accrue to a few individuals, but not others, resulting in competition among ladder careerists (Teodoro 2011). Two objections to this view are that, first, promotions are often not tied closely to performance in the public sector - direct performance incentives are famously hard to sustain in public bureaucracies - and that, second, bureaucrats are motivated not by career ambition but by service to the public good (for discussions of both, see Esteve and Schuster 2019).

Both objections are likely true to a degree. However, empirical evidence underscores that career incentives in public service *are* real motivators (e.g. Bertrand et al. 2020; Karachiwalla and Park 2017). For instance, a recent ten-country survey of civil servants across four world regions found that only 7% of civil servants considered performance *not at all* important for their promotion prospects (Meyer-Sahling et al., 2018). With that said, in career systems in the sample, up to a

quarter indicated that performance was *not at all* important for promotions – with, instead, internal promotions often hinging on seniority (Meyer-Sahling et al., 2018, 37).

The career incentive effect underlying our argument is thus likely greater in position-based civil service systems than career systems. In career systems, the relevance of seniority for promotions subdues competition with educated newcomers for performance-based organizational rewards, as does the restriction of recruitment to entry level jobs, which shield those further up the hierarchy.¹ By contrast, in position-based systems, bureaucrats compete at all hierarchical levels for rewards with educated newcomers during periods of professionalization.

Signaling to outside employers for ‘ramp careerists’

The other mechanism we argue is set in motion by professionalization relates to the external labor market of public bureaucracies for ladder careerists (Teodoro 2011). Human capital theory from its origins treated expertise acquisition and rewards (like promotions) in part as signals to outside employers, with expertise increasing the value of bureaucrats to outside employers (Becker 1962), and promotions signaling ability to potential outside employers (Waldman 1984). A core driver of these latter models is that bureaucracies know more about the bureaucrats they employ than other organizations know about those same bureaucrats. Other organizations see first and foremost the actions of bureaucrats' current employer. Consequently, absent other information, the market for bureaucrats who exit their organization becomes a market for lemons: other potential employers infer that the bureaucrats must have low ability from their previous organization letting them go (cf. Bertelli and Lewis 2012).

Since visible information related to their ability holds importance to their careers, bureaucrats pursue various strategies for signaling their worth to outside potential employers. This is why

Teodoro's (2011) ramp careerists are policy entrepreneurs. They innovate to be known as innovators on the labor market (see also Teske and Schneider 1994). Years of experience in a prestigious or technically oriented organization can contribute in the same way, so long as employee exit is voluntary. The same mechanism applies to expertise acquisition and training: they function as credentials to potential future employers (cf. Becker 1962, 16).

As a result, bureaucrats facing competition for organizational rewards from educated newcomers are incentivized to acquire expertise even if they believe they will not successfully compete for organizational rewards (cf. Clingermayer and Feiock 1997). If expertise serves as a signal, developing expertise becomes a viable first step in a bureaucratic exit strategy. If bureaucrats cannot compete in the internal competition for organizational rewards, they can exploit the expertise they develop while in public office to improve their chances later on the external labor market. External labor markets are relevant for bureaucrats in many public sectors: in the UK civil service and US federal government, for instance, turnover stands at 9% and 7% per year respectively (IfG 2019; OPM 2021).

With increases in educated entrants as public bureaucracies professionalize, the incentive to develop expertise strengthens as outside career options become more attractive or plausibly needed. Once again, professionalization begets professionalization.

In summary, as bureaucracies professionalize, incumbent bureaucrats are incentivized to acquire expertise to both compete with educated newcomers and enhance their attractiveness to outside employers as internal career advancement becomes more competitive. This leads us to hypothesize:

Hypothesis 1: The entry of more educated recruits into bureaucracies increases the importance incumbent bureaucrats place on their own expertise development.

Our theory focuses on the demand-side: bureaucrats placing importance on and thus pursuing expertise acquisition in the broadest sense. It is agnostic about how expertise is supplied, for instance whether government organization supply on-the-job training or whether bureaucrats engage with professional organizations. Instead, depending on what it takes to secure internal career advancement or outside labor market opportunities, expertise development could range from formal upskilling through better educational qualifications to work experience with particularly complex projects to strategies that build bureaucrats' individual reputation as top experts in certain fields. As a corollary, we follow classic works on civil service professionalization and treat the concepts of education, expertise, and professionalization interchangeably. For instance, Silberman's (1993, 65, 75) classic work relates professionalization to "educational/expertise merit" and "professional expertise and certification." Similarly, Weber (1978, 349, 352) relates professionalization to both "specialist qualification" and "expert knowledge."

Hypothesis 1 is, of course, not without scope conditions. In particular, we expect career incentives due to professionalization to be stronger for bureaucrats who are more in need of developing expertise to remain competitive in labor markets. For instance, some bureaucrats may believe their existing expertise credentials are already sufficient to obtain jobs outside government if necessary. Their signals to outside employers are "saturated" and the marginal benefit of acquiring additional expertise in response to professionalization is limited. If educated newcomers outcompete them for organizational rewards inside bureaucracy, the external labor market will recognize their value rather than lump them in with the lemons (cf. Waldman 1984). Consequently, for these bureaucrats, we would not expect professionalization to beget professionalization to the same degree.

Hypothesis 2: The entry of more educated recruits into bureaucracies increases the importance placed on expertise development among incumbent bureaucrats who do not believe they have equally rewarding outside options for employment.

Hypothesis 2 thus conditions Hypothesis 1. Not because ambition is constrained but because ambition can find outside outlets. Evidence for Hypothesis 2 would thus also suggest that the effect of professionalization on incumbent recruits is not due to, for instance, commitment to public service (though bureaucrats may certainly be committed), or strategies for building autonomy (though bureaucrats certainly may pursue these). Instead, it would suggest that, as we had theorized, expertise acquisition in response to professionalization is a function of career incentives to achieve rewards from incumbent organizations or in the external labor market.

Data and method

We assess our hypotheses through a survey – information treatment or ‘prime’ – experiment with over 3,000 bureaucrats in Chile’s central government. As detailed below, our prime renders salient bureaucratic professionalization (understood as the entry of more educated recruits into bureaucracy) to a random subset of respondents, allowing us to exogenously manipulate the salience of professionalization prior to survey questions about expertise acquisition. This exogenous manipulation is key to avoid endogeneity concerns. Simply correlating education of new entrants in an organization with expertise acquisition of incumbent bureaucrats would not isolate the causal effect of the former on the latter. Organizations which prioritize the entry of educated recruits may equally undertake initiatives to upskill bureaucrats, for instance. Our experimental design allows us to overcome this endogeneity concern by randomly priming a subset of bureaucrats about bureaucratic professionalization and thus more plausibly isolating its causal effects on bureaucrats.

Case selection

Our survey was conducted with the support and authorization of the Chilean Civil Service Agency between November 2016 and January 2017.ⁱⁱ Chile's central government is a propitious environment for studying the effects of professionalization.

While Latin America's "civil service systems ... are substantially more politicized than those in Western European countries" (Ramos and Peters, 2021, 2), Chile ranks top in civil service professionalization in the region (Inter-American Development Bank, 2014). This is in part due to a 2003 reform which professionalized the senior civil service and created a Civil Service Agency (cf. Alberts, Davila and Valenzuela, 2021). In part, it is also due to a massive entry and increase in the share of university-educated bureaucrats in the last decade by 70%, which we exploit in our information treatment (see below). This increase was not due to governmental training programs (which amount to less than 1% of wage spending; Servicio Civil, 2018). Rather, it came from an increase in merit examinations for entry at all levels (Schuster et al., 2020), coupled with greater educational attainment of young graduates (OECD, 2019).

At the same time, bureaucrats in Chile's government may be expected to face the career incentives our theory builds on. Mirroring other Latin American countries – with the region undergoing several New Public Management (NPM)-inspired reforms in the last 25 years (Ramos and Milanese, 2021) – Chile transitioned from a civil service system with recruitment at entry level, internal promotion, and tenure protections to a position-based civil service system with temporary (annually renewed) contracts (*contrata*), and lateral entry at higher ranks. While, in 1995, 70% of civil service positions were permanent and 30% were temporary, by 2019, these percentages had reversed (Dirección de Presupuestos del Ministerio de Hacienda 2021). In other words, professionalization was accompanied by greater precarity in formal contractual terms.ⁱⁱⁱ Outside labor markets thus remain important for Chilean bureaucrats in case contracts come to an end. At

the same time, NPM reforms did bring with them competition for organizational rewards: 86% of public servants deem work performance important to get a promotion, and 43% see good opportunities for career development in the public sector for themselves (Schuster et. 2020). The entry of educated newcomers could thus expose Chilean bureaucrats to the type of career incentives – in both internal and external labor markets – that our theory builds on.

Nonetheless, Chile remains (somewhat) comparable to career civil services elsewhere. The shift towards a position-based civil service with temporary contracts in Chile did not undo lifelong careers. According to recent constitutional court verdicts, temporary contracts convert after two years of service in practice into indefinite contracts (requiring just cause for non-renewal), and fixed term employees have 13 years of service on average in the public sector, with annual rotation under 1% (Ministerio de Hacienda, 2021). Findings from Chile might thus travel to career systems.

Data

Our survey frame consists of all 13,731 employees in ten central government institutions in Chile. The ten institutions were selected with Chile's Civil Service Agency to cover a wide spectrum of policy areas within central government.^{iv} Employees in these institutions slightly less often have primary or secondary educational backgrounds (23%) than (most of) central government (28%), and slightly older (43 years vs. 42 years) (cf. Schuster et al., 2020). Our information treatment was embedded in a broader survey of civil service management in these institutions. 2/3 of respondents were randomly assigned to participate in the experiment (1/3 was assigned to a different treatment). The survey was distributed online through Qualtrics. Among the respondents assigned to participate in the experiment, 3,457 responded (38% response rate).

Available administrative data suggests that our sample is roughly representative of our survey population in terms of gender (56% women in the sample compared to 55% in the survey frame) and age (averaging 39 years in the sample and 43 in the survey frame), and less often have

secondary or primary educational backgrounds (table 1). As we randomly assign treatment and control groups *among* respondents, we do not have reason to believe that non-response biases our findings.

[Table 1 around here]

To ensure valid measurement, we pre-tested survey instruments (and our information treatment) in ten cognitive interviews in Spanish with public servants across institutions and levels of the hierarchy. Survey items were developed in English, and subsequently translated and back-translated from Spanish to safeguard against translation effects.

Experimental treatment

We randomly assigned respondents into two groups. In the treatment group, respondents were presented with a graphic displaying information about bureaucratic professionalization in Chile. The control group, by contrast, received no information. Figure 1 shows the treatment as it appeared to respondents. The English translation of the text is as follows:

*Did you know that the Chilean public sector is undergoing a strong professionalization process?
In the last ten years, the number of professionals in public administration has grown by 70%.*

[Figure 1 around here]

It is important to note that the term "professional" in Chile's public administration implies university-educated employees. The prime thus renders salient not only an uptick in bureaucratic professionalization, but one tied to education. This is, as noted above, consistent with prior works which link professionalization to educational qualifications (e.g. Silberman, 1993; Weber 1978).

The treatment is intended to treat respondents' beliefs about human capital build-up in their work surroundings. If our theory holds, the treatment should increase respondents' willingness to acquire expertise. Our design comes with costs and benefits. On the benefit side, our treatment targets the mechanism of interest as it exploits a (factual) professionalization process, which theoretically should activate respondents' beliefs that they need to upskill to meet their ambition for organizational rewards, lest the well-educated newcomers outcompete them.

On the cost side, it signals professionalization using the educational makeup of the civil service rather than the more complex skills makeup of respondents' immediate surroundings. However, priming "closer to the respondent", e.g. on their own organization or team, risks treatments being unbelievable to respondents who, for instance, have had no new entrants into their team for a long time. At the same time, treating respondents about the professionalization of public administration as a whole – rather than of bureaucrats in the respondent's organization or team with whom they compete more directly for promotions – is arguably a weaker treatment. This limitation should thus bias our treatment *against* finding support for our hypotheses.

Measures

To measure our main dependent variable – the importance respondents place on expertise (*expertise* below) – we asked respondents to agree or disagree on a five-point Likert scale with the statement: "As a public servant, it is important for me to be an expert in my work". In our analysis, the variable spans from 0 (strongly disagree) to 4 (strongly agree). As noted above we thus focus on the demand-side of expertise – rather than the organizational supply of upskilling – and the target domain of this variable is deliberately broad to encompass a wide variety of bureaucratic strategies related to expertise acquisition or upskilling, as those might vary across individuals.^v

To assess Hypothesis 2, we measure our respondents' beliefs about their outside options for employment. To capture these, we use a single, pre-treatment, item from the survey, answered on

the same agreement scale: "It would be easy for me to find a job outside the public sector that pays as well as my current job". Where respondents agree, they face fewer career incentives to upskill to obtain better jobs. In our analyses, we dichotomize this variable to form a “*has no outside employment options*” group consisting of respondents who strongly or somewhat disagree with the statement and a “*has outside employment options*” group of respondents who do not disagree with it (in addition to making conceptual sense, this split falls along the variable median). We estimate conditional average treatment effects within these subgroups.

Appendix A shows the descriptive statistics for these variables, alongside pre-treatment covariates used for balance testing below.

Methods

Our analysis proceeds in three steps. First, we report the raw average treatment effect (ATE) of our treatment to test hypothesis 1. In this step, the ATE is calculated using permutation inference and bootstrapped standard errors to avoid model dependence of our results (e.g. Gerber and Green 2012). Estimates and standard errors were based on 10,000 resamples using the `infer` package for the R environment (Bray et al. 2019). Using the same estimation technique, we then test hypothesis 2 by estimating the conditional average treatment effect (CATE) in subgroups formed by the dichotomized *outside options* variable. Finally, we provide a series of robustness tests to account for clustering of responses and heterogeneity of effects by contract type or institution.

Results

As context for our results, balance tests suggest that our treatment is balanced on observed variables such as years of service, rank, income, and age (Appendix B). We do not observe statistically significant differences at the 5% level for any variable, and a joint orthogonality test sustains the

hypothesis that all covariates are collectively balanced on treatment and control (Appendix B). Our results replicate when including all of the balance covariates as control variables (Appendix D).

Figure 2 shows our main results: the difference in means of the *expertise* variable between treatment and control group (see Appendix C for results tables). Our treatment increases the importance respondents' place on expertise acquisition ($est = 0.063, p_{two-sided} = 0.001$). This effect is not only statistically significant, but also substantively relevant: it is equal to half the standard deviation of the variable. This lends support to Hypothesis 1.

[Figure 2 around here]

We, next, assess hypothesis 2. If it were true, we would expect the treatment to more effective for bureaucrats who do *not* believe they could easily find a private sector job with their expertise. To this end, we add the measure of our respondents' belief that equally well or better-paid outside employment is easily available to them, estimating the CATE for respondents who (strongly or somewhat) disagree and respondents who do not disagree. We expect a significant CATE in the ‘*has no outside employment options* group’ (i.e. the group disagreeing it would be easy to find a private sector job), but not (necessarily) the ‘*has outside employment options*’ group. The data support this expectation. The CATE in the group without private sector employment options is indeed positive and significant ($est = 0.085, p_{two-sided} = 0.004, n = 1.364$) whereas the CATE in the group with private sector employment options is half its size and not significant at conventional levels, despite representing a larger subgroup ($est = 0.040, p_{two-sided} = 0.126, n = 1.846$) (figure 2).

In line with our theoretical argument, this suggests that career incentives shape the effect of bureaucratic professionalization on bureaucrats. In layman's terms: bureaucrats who learn about professionalization of peers place greater importance on their own expertise acquisition, but only if they do not have attractive outside career options.

Robustness

Finally, we probe the robustness and within-sample generalizability of our findings.

First, we assess whether our analysis is robust to removing institutions, in order to evaluate whether our findings hinge on, say, the auditors in the tax administration or other groups with a very particular human capital stock or where professionalization is particularly pronounced. We do not find this to be the case: our findings hold when dropping individual institutions from our sample (Appendix E).

Second, we assess whether our treatment differs across institutions or, importantly, respondent ranks. Using random slope and intercept models (using model comparisons and χ^2 tests in the lme4 package for the R environment, see e.g. Gelman and Hill 2007), we do not find this to be the case either for institutions ($\chi^2 = 0.079, df = 2, p = 0.962$) or rank ($\chi^2 = 0.195, df = 2, p = 0.907$). Moreover, our findings do not appear to be threatened by our respondents being nested in their particular institutions. Since only ten institutions participated in the survey, ordinary clustered standard errors may be inconsistent. Consequently, following Cameron et al. (2008), we estimate these standard errors using a wild cluster bootstrap using Esarey's (2019) clusterSEs package for the R environment. This analysis sustains our main conclusion ($est = 0.059, p_{two-sided} = 0.031, 95\% CI = [0.007, 0.111]$). Finally, an institutional fixed effects specification with covariates also sustains our conclusions (Appendix D and F). In sum, these analyses suggest that contagious professionalization is not a phenomenon isolated to particular islands of professional bureaucracy.

Third, we assess whether our treatment effects depend on bureaucrats holding fixed-term contracts. As noted above, most bureaucrats in Chile hold temporary contracts in a position-based system. While many still have lifelong public sector careers in practice, this raises the concern that our findings depend on (temporary) contract types and do not travel to civil servants on permanent career contracts, with potentially weaker career incentives to respond to professionalization of peers. To assess the robustness of our findings to contract type, we re-estimate our models controlling for contract types (Appendix F), and, additionally, assess whether treatment effects differ by contract type (Appendix G). Our results are robust in models controlling for contract type and we do not observe statistically significant differences in our treatment between temporary and permanent contracts within Chile's civil service – though the direction of the effect provides suggestive evidence that bureaucrats on temporary contract react more strongly to professionalization. This suggests that our argument does not (fully) depend on – and thus might be generalizable across – temporary and permanent contracts.

Discussion

Our findings have significant implications for the study of bureaucratic professionalization and expertise acquisition.

First, we provide experimental evidence relevant to debates about expertise acquisition and upskilling in bureaucracy. Understanding employee demand for expertise is of great importance, with, for instance, the development of expertise acting as an important competition parameter as public sectors seek to retain talent. Our contribution was a first experimental step towards understanding the organizational factors which shape employee demand for upskilling.

Second, our study contributes to our understanding of bureaucratic and state development. On a macro level, our findings point to organizational dynamics often overlooked in studies of bureaucratic professionalization. Arguments in this literature focus on the political drivers of bureaucratic development, such as war (Ertman 1997) or electoral constituents (Shefter 1994), among many. They often overlook organizational drivers, however, instead portraying developing bureaucracies without agency by bureaucrats and the endogenous processes informing their career choices (cf. McDonnell 2020 for an exception). Our findings suggest this omission is important. While public management may be neglecting the state (Milwart et al. 2016), studies of the state need to be careful not to miss the organizational dynamics of concern to public management. These processes may matter, also to macro phenomena like professionalization of bureaucracies.

Our findings are thereby good news. In bureaucracies transitioning from patrimonial to meritocratic administrations, the capacity (and morals) of incumbent bureaucrats are often questioned (e.g. Holmes 2006; Meyer-Sahling 2006), suggesting that bureaucrats might be an obstacle to professionalization. While this might be true at the collective bargaining level (cf. Nigro, 1970), our findings suggest that individual career incentives can reinforce professionalization. Merit recruitment of (more) educated recruits leads incumbent bureaucrats to upskill to remain competitive in the struggle for organizational rewards and outside jobs, thus leading to capacity improvements of both new and incumbent bureaucrats. Bureaucratic professionalization is thus contagious and begets further professionalization.

Third, our findings point to possibilities for channeling bureaucratic ambition and the limits of doing so. Our findings add further evidence that relatively low-powered career incentives can shape bureaucratic ambitions (Lazear and Posen 1981; Bertrand et al. 2020; Karachiwalla and Park 2017). Growing expertise among incumbent bureaucrats thereby enables organizations to enhance bureaucratic capacity without, as in the case of educated new hires, forgoing accumulated public

sector knowledge. Our theorized career incentives have limits, however. If bureaucrats believe attractive outside employment are available to them, professionalization is not contagious. Instead, it may risk spurring departures of bureaucrats with outside options. Future research could assess whether this is the case.

Fourth, future research on contagious professionalization could further explore the motivations underpinning demand for expertise. Our argument draws on career incentives. However, professionalization may also shape intrinsic motivations of incumbent bureaucrats (cf. McDonnell 2020). Weber (1978) imbued the bureaucracy with an *esprit de corps*, which merit bureaucrats socialize into – and are motivated by – after entry. While intrinsic motives could well complement our incentive-based argument, our empirical evidence is more readily explained by career incentives.

Lastly, our findings underscore the relevance of studying contagion effects across bureaucrats in public administration reform. Studies of bureaucratic reform have started to experimentally assess how bureaucrats react to reforms imposed on them – such as pay-for-performance schemes (see, e.g. Luo et al. 2020). Our study suggests that scholars need to go one step further and consider how the introduction of new practices or norms can be contagious and come to shape the behavior of bureaucrats beyond those actually targeted by the reform (new recruits in our instance). To illustrate with the pay-for-performance example: is greater performance orientation of those ‘treated’ with a pay-for-performance scheme contagious and affecting the performance orientation of other bureaucrats not under the pay-for-performance scheme? The answer to such ‘contagion’ questions shapes the desirability of public administration reforms, yet such contagion or spillover effects are rarely systematically assessed (cf. Kroll, Neshkova and Pandey, 2017).

While we believe these findings contribute importantly to our understanding of bureaucratic development, expertise acquisition and bureaucratic reform more broadly, they should be read with several limitations in mind.

Most importantly, we relied on survey measures of the importance bureaucrats place on expertise rather than actual enrolment in on-the-job training or other upskilling behavior. Given our survey experimental setup and our ambition to not focus on particular strategies for bureaucratic expertise acquisition, we were unable to measure real-world upskilling behavior. This is a limitation of our study. Our survey measure might be inflated due to social desirability bias, potentially attenuating a treatment effect. Moreover, while our information treatment is a true (informational) reflection of the real-world professionalizing civil service environment in which our respondents operate, it limits us to estimating a short-term change in attitudes towards expertise. Whether these attitude changes translate into actual expertise acquisition – such as enrolment in on-the-job training – remains an empirical question, though prior research suggests that attitudes often predict behavior (e.g. Ajzen and Fishbein 1980). It will take a field experiment with administrative measures of upskilling behavior to provide more conclusive empirical evidence.

Similarly, we conceptually intertwine professionalization, increased educational qualifications, and expertise acquisition across our treatment message and post-treatment question. The lack of perfect overlap of these concepts is a limitation of our manuscript, and future studies could narrow in on one of these concepts, rather than following classic works on professionalization which intertwine them.

At the same time, we conducted our survey experiment in a single country, Chile, in ten central government institutions. While our robustness checks underscore that our findings generalize across the ten institutions and ranks, assessing their external validity beyond that remains for future work.

Chile was a propitious case for study due to the government's rapid recent professionalization, and our sample of institutions covered a range of government functions. At the same time, career incentives in Chile's central government – with an open, position-based system – might be stronger than in, particularly, closed career systems with seniority-based (years of service rather than performance-based) promotions – though the quasi-indefinite nature of fixed term contracts in Chile assuages this concern somewhat. On an upside, recent studies have found that promotion incentives shape bureaucratic behavior even in closed career systems (Bertrand et. Al, 2020), and we, similarly, did not find statistically significant differences in treatment effects by contract type in Chile, suggesting our results might be generalizable to closed career systems. Whether they are – and which types of bureaucrats react to professionalization most forcefully – remains for future studies to assess, however.

Conclusion

We have proposed a theory of contagious professionalization. Our theory predicts that bureaucratic ambition – specifically competition for organizational rewards and the importance of labor market signals to potential outside employers – drives incumbent bureaucrats to develop expertise when faced with the arrival of educated newcomers. Our large-scale survey experiment supports this prediction.

We encourage research to further examine the contagious nature of professionalization in different contexts, and to appreciate possible contagious processes propelled by other management practices. Moreover, our findings underscore the importance of taking individual bureaucratic agency in response to public management reforms seriously. Finally, they point to bureaucratic incentives to upskill – a topic which has been largely neglected despite the importance of continuous upskilling in public sector work.

Notes

ⁱ Even in a career systems, however, recent recruits would (eventually) compete with more educated newcomers. More educated newcomers are likely to achieve promotion quicker, thus competing in the medium term for promotions with those in higher ranks. So long as promotions are not purely seniority-based, professionalization may thus shape career incentives.

ⁱⁱ The survey provided Chilean state institutions with a civil service management diagnostic in return for participation. The prime was embedded within this broader civil service management survey.

ⁱⁱⁱ Professionalization extended to all contract types. The share of employees on permanent contracts without university education has fallen by roughly a quarter in the last decade, by some estimations (Schuster et al., 2020).

^{iv} The ten institutions included are the Economic Development Agency (CORFO), Civil Service Agency (DNSC), Public Prosecutor's Office (MP), Planning Directorate in the Ministry of Public Works (DP-MOP), Solidarity and Social Investment Fund (FOSIS), Directorate for Libraries, Archives and Museums (DIBAM), Legal Medical Service (SML), National Fishery Service (SERNAPESCA), National Health Fund (FONASA) and Social Security Institution (IPS).

^v Given the aforementioned entanglement of these concepts in classic studies of professionalization (e.g. Silberman, 1993, 65, 75; Weber 1978), our prime focuses on professionalization and educational qualifications, while our post-prime measure captures expertise acquisition. This might attenuate our treatment effects – i.e. bias them against seeing a significant effect of our prime.

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Tables and Figures

Table 1. Survey representativeness

	Sample	Survey population
Percent female	56%	55%
Percentage with primary or secondary education	19%	23%
Mean age ^a	39	43

Sources: survey population data provided by surveyed government institutions. (a) Estimated based on averaging age bands.

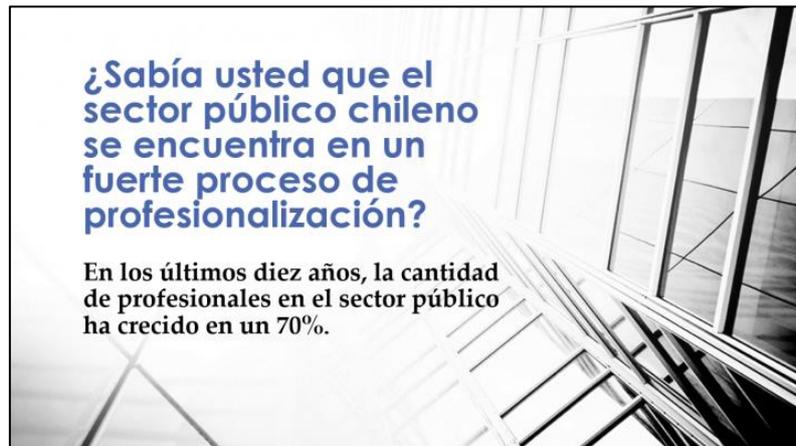
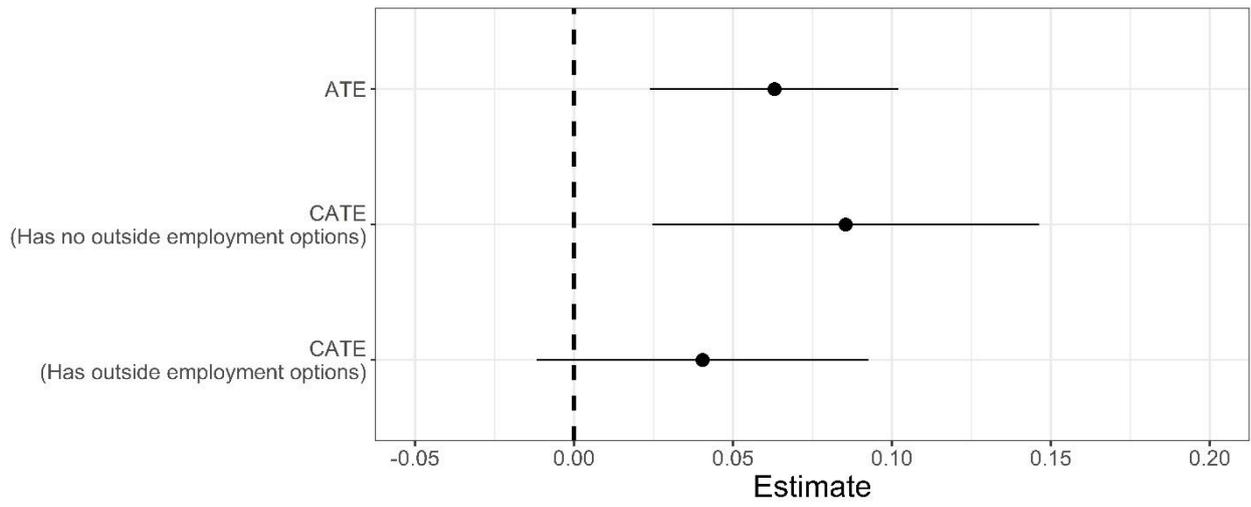


Figure 1: The ‘professionalization’ treatment as seen by respondents

Figure 2: Main results



Estimates with 95% bootstrapped confidence intervals. Each row shows an estimate from a separate model. The dependent variable for all models is Upskill myself. n from top to bottom is 3.222, 1.364, and 1.864. Randomization inference-based P values from top to bottom are 0.001, 0.004, and 0.126.

Appendices

Appendix A: Descriptive Statistics

	N	Mean	Std.Dev	Min	Max
Treatment assignment: treatment	1761	0.509	0.500	0	1
Treatment assignment: control	1696	0.491	0.500	0	1
Upskill myself	3301	3.758	0.568	0	4
Outside options	3210	1.705	1.323	0	4
Gender: Female	1920	0.562	0.496	0	1
Gender: Male	1496	0.438	0.496	0	1
Age	3443	39.207	11.440	18	62
Tertiary education: No	668	0.195	0.396	0	1
Tertiary education: Yes	2762	0.805	0.396	0	1
Income: Low	449	0.134	0.341	0	1
Income: Medium	2241	0.670	0.470	0	1
Income: High	654	0.196	0.397	0	1
Rank: Administrative support	960	0.278	0.448	0	1
Rank: Technical professional	2383	0.689	0.463	0	1
Rank: Management	114	0.033	0.179	0	1
Years of service	3447	14.598	10.322	0	49

Descriptive statistics for prime treatment assignment, dependent variables, and covariates. Mean indicates means for variables considered quantitative and proportion for variables considered categorical, the latter identified using the variable name and value separated by colons. Min and max are observed minimum and maximum in the dataset and can thus deviate from theoretical minimum or maximum.

Appendix B: Balance tests

	Treatment group	Control group	P value
Age	39.130	39.281	0.880
Gender: Female	0.578	0.547	0.075
Gender: Male	0.422	0.453	
Income: Low	0.141	0.128	0.571
Income: Medium	0.661	0.679	
Income: High	0.199	0.193	
Rank: Administrative support	0.277	0.279	0.922
Rank: Management	0.031	0.035	
Rank: Technical professional	0.692	0.687	
Tertiary education: No	0.188	0.202	0.275
Tertiary education: Yes	0.812	0.	
Years of service	14.472	14.721	0.515
Joint orthogonality test			0.433

Treatment and control group means (for quantitative variables) and proportions (for categorical variables) with p values from covariate balance tests.

Appendix C: Main results (in table form)

Dependent variable	N	Estimate	Standard error	P value	95% confidence interval
All (ATE)	3.222	0.063	0.020	0.001	[0.025, 0.102]
No outside options (CATE)	1.364	0.085	0.031	0.006	[0.025, 0.146]
Outside options (CATE)	1.846	0.040	0.027	0.126	[-0.012, 0.093]

ATE and CATE estimates with randomization inference-based P-values and 95% bootstrapped confidence intervals. Each row shows an estimate from a separate model.

Appendix D: Results with covariates

	Estimate	95% percentile confidence interval	Estimate	95% percentile confidence interval
Treatment	0.061*** (0.000)	[0.023, 0.102]	0.058** (0.004)	[0.020, 0.097]
Gender: Male	-0.025 (0.104)	[-0.068, 0.013]	-0.025 (0.230)	[-0.065, 0.015]
Age	-0.001 (0.260)	[-0.003, 0.002]	0.000 (0.772)	[-0.002, 0.003]
Tertiary education	0.048‡ (0.071)	[-0.018, 0.114]	0.053 (0.145)	[-0.019, 0.126]
Income: Medium	0.036 (0.147)	[-0.032, 0.104]	0.040 (0.273)	[-0.028, 0.113]
Income: High	0.041 (0.149)	[-0.039, 0.119]	0.047 (0.292)	[-0.039, 0.135]
Rank: Professional	0.013 (0.350)	[-0.048, 0.074]	0.027 (0.394)	[-0.031, 0.092]
Rank: Management	0.081‡ (0.054)	[-0.019, 0.180]	0.099‡ (0.082)	[-0.014, 0.210]
Years of Service	0.004** (0.002)	[0.001, 0.006]	0.002 (0.161)	[-0.001, 0.004]
(Intercept)	3.635*** (0.000)	[3.535, 3.737]	3.399*** (0.000)	[3.205, 3.581]
Institution fixed effects	No		Yes	

*Results from bootstrapped OLS regressions with 95% confidence intervals. 2,000 resamples were used for each model. Standard errors assume normal sampling distribution. ‡ $p < 0.100$, * $p < 0.050$, ** $p < 0.010$, *** $p < 0.001$*

Appendix E: Results dropping single institutions

Excluded institution	Remaining N	ATE estimate	95% confidence interval
CORFO	3033	0.060** (0.021)	[0.019, 0.099]
DP-MOP	3146	0.062** (0.020)	[0.025, 0.102]
DIBAM	2962	0.068** (0.021)	[0.030, 0.110]
DNSC	3118	0.062** (0.020)	[0.025, 0.102]
FONASA	2888	0.069** (0.021)	[0.031, 0.111]
FOSIS	2916	0.065** (0.020)	[0.024, 0.105]
IPS	2754	0.051* (0.021)	[0.009, 0.093]
MP	2356	0.074** (0.025)	[0.028, 0.124]
SERNAPESCA	2983	0.056* (0.021)	[0.015, 0.097]
SML	2986	0.063** (0.021)	[0.022, 0.104]
MOP	2638	0.056* (0.023)	[0.013, 0.098]

*ATE estimates from bootstrapped OLS regressions without covariates with 95% confidence intervals. 2,000 resamples were used for each model. Standard errors assume normal sampling distribution. ‡ $p < 0.100$, * $p < 0.050$, ** $p < 0.010$, *** $p < 0.001$*

Appendix F: Results controlling for contract type & institution fixed effects

	Estimate	95% percentile confidence interval	Estimate	95% percentile confidence interval
Treatment	0.059** (0.002)	[0.021, 0.099]	0.056** (0.006)	[0.016, 0.095]
Gender: Male	-0.025 (0.119)	[-0.068, 0.015]	-0.024 (0.264)	[-0.064, 0.018]
Age	-0.001 (0.189)	[-0.004, 0.001]	0.000 (0.809)	[-0.002, 0.003]
Tertiary education	0.045 (0.101)	[-0.024, 0.118]	0.052 (0.165)	[-0.023, 0.120]
Income: Medium	0.035 (0.146)	[-0.029, 0.108]	0.036 (0.339)	[-0.035, 0.112]
Income: High	0.042 (0.145)	[-0.035, 0.128]	0.043 (0.359)	[-0.048, 0.137]
Rank: Professional	0.013 (0.334)	[-0.046, 0.073]	0.027 (0.395)	[-0.034, 0.090]
Rank: Management	0.084‡ (0.056)	[-0.018, 0.179]	0.114* (0.042)	[0.001, 0.227]
Permanent Contract	-0.014 (0.292)	[-0.063, 0.037]	-0.056 (0.103)	[-0.124, 0.010]
Years of Service	0.004*** (0.000)	[0.001, 0.007]	0.003* (0.030)	[0.000, 0.005]
(Intercept)	3.649*** (0.000)	[3.535, 3.758]	3.404*** (0.000)	[3.218, 3.583]
Institution fixed effects	No		Yes	

*Results from bootstrapped OLS regressions with 95% confidence intervals. 2,000 resamples were used for each model. Standard errors assume normal sampling distribution. ‡ $p < 0.100$, * $p < 0.050$, ** $p < 0.010$, *** $p < 0.001$*

Appendix G: Results: Interaction Effect between Treatment and Contract Type

	Model without interaction	Model with interaction
Treatment	0.055** (0.020)	0.066** (0.025)
Permanent contract	0.004 (0.021)	0.020 (0.030)
Treatment × Permanent Contract		-0.032 (0.042)
(Intercept)	3.728*** (0.016)	3.723*** (0.017)
N	3281	3281
R-squared (adj.)	0.002	0.002

Results from ordinary least squares models Model comparison statistic: $F = 0.579$ ($df = 1$ $p = 0.447$). $\ddagger p < 0.100$, $* p < 0.050$, $** p < 0.010$, $*** p < 0.001$