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REPLICATION

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A replication of "exploring and explaining contracting out: Patterns among the American states"

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Abstract

This manuscript conducts both a narrow and wide replication of Brudney et al. (2005, Journal of Public Administration Research and Theory, 15[3], pp. 393–419), focusing on the scope, perceived effectiveness, and antecedents of contracting out. The replication joins the original study in indicating that state agencies widely used contracting out in service delivery, but their perceived effects on service costs and quality were mixed. The replication coincides with the original study in suggesting that contracting out was an agency-specific practice driven more by pragmatic factors but reports some divergences in the effects of individual factors. Overall, our replication concurs with the original study in many aspects, but also adds new nuances. There seems to be no single pattern underlying the use of contracting out, and thus no single factor could determine contracting out under all circumstances. Rather, contracting is a dynamic practice used by agencies for certain contingencies.

Abstract

本论文对 Brudney 等人(2005, Journal of Public Administration Research and Theory, 15[3], pp. 393–419) 的重要研究进行了狭义和广义上的结果再现，并重点关注政府外包的范围、有效性感知和决定性因素。 基于更新和更全面的数据，本文的结果总体与原文保持一 致，即尽管州机构在公共服务中广泛使用外包策略，但它们对公共服务成本和质量

的感知却参差不齐。 尽管单个变量的偏效应存在部分差别，但本文的稳健结果再次证明，外包决策主要取决于个体机构的特征，更多地受现实需要驱动。此外，我们的论文发现与原文存在一些细微的差异，我们发现外包决策的决定并不受单一稳定因素的驱动，相反，它是随着机构的变化而动态变化的.

1 | INTRODUCTION

Since the New Public Management movement in the 1980s, contracting out has been widely used in various countries as a public service delivery mechanism (Hood, 1991; Kelman, 2002; Pollitt & Bouckaert, 2004). Instead of relying on public employees to directly serve citizens (in-house delivery), governments form contractual relationships with third-party organizations and hire them to deliver publicly funded services to citizens (contracting out). As government contracting becomes a widespread government tool in public service delivery, it attracts substantial scholarly attention. Within the long volume of literature on government contracting, one well-cited research is Brudney et al. (2005). The study undertakes an early, systematic examination of government contracting among American states. Using survey data from state agency leaders in the 50 American states in 1998 as well as sociodemographic data, the study examines three important questions on government contracting, including its scope, perceived effectiveness, and antecedents.

This manuscript replicates Brudney et al.'s (2005) results in both a narrow and wide sense. First, we narrowly replicated the study using similar data and model specifications. Second, we replicate the study in a wide sense by using panel data from later years while sticking to the original specification. Both replications concur with the original study in many aspects but also add new and interesting nuances. Specifically, both the original study and our replications consistently show that state agencies across the United States engaged extensively in contracting out in delivering services to the public, but these agencies typically allocated a modest proportion of their agency budgets to this practice. Moreover, the original and replication studies similarly report that the state agency leaders' perception of the effectiveness of contracting out was split, with approximately half of the leaders agreeing that contracting out improves service quality, while only a third of them suggesting that contracting out contributes to cost savings.

Concerning the antecedents of contracting out, our replication coincides with the original study in several ways. Overall, contracting out is an agency-specific practice shaped more by individual agency contexts than by the broader sociodemographic environment. In addition, contracting out is driven more by pragmatic factors than ideological and political factors.

Specific to the effects of individual antecedents, there are some divergences between the original study and the replication. Although these differences could result from data and variable measurements, they might imply the dynamics and complexity of contracting out. In other words, contracting out is a dynamic practice used by agencies to serve pragmatic needs under certain contexts. There is no single factor that could dominate the explanation of contracting out.

The remainder of the paper is organized as follows. The second section provides a brief synopsis of the original study being replicated. Then, we discuss our replication methods in the third section, including the data and variables. The fourth section presents our replication results. We discuss the findings and conclude the manuscript in the fifth section.

2 | A SYNOPSIS OF ORIGINAL STUDY

The significant use of contracting out in public service delivery motivates scholars to examine various aspects of government contracting. Brudney et al. (2005) is an early study in this line of inquiry with a focus on the American

states. The study examines three important questions on government contracting: (1) the extent of contracting out by state agencies, (2) the perceived effect of contracting out on service delivery outcomes, and (3) the factors shaping the level of contracting out among state agencies.

The data for the first two questions came from the 1998 American State Administrators Project (ASAP) survey. The survey was sent to 3541 agency heads from 95 different types of agencies in the 50 American states and produced usable responses from 1175 agency heads, which is equivalent to a response rate of 33%. One unique advantage of the survey data is that the survey covered a wide range of state agencies and their heads, and its respondents represent the universe of state administrators at large (Wright & Cho, 2001). This advantage allows the study to comprehensively capture government contracting practices at the state level across the United States.

The survey responses indicated that government contracting was employed extensively by state agencies to deliver services to the public (72.5% of agencies). Among those agencies employing contracting out, government-business contracting was used most frequently (82.9% of agencies), followed by government-nonprofit contracting (71% of agencies) and government–government contracting (61.1% of agencies). However, despite the extensive use of contracting out, the percentage of the agency budget allocated to it was modest. One-third of the agencies contracted out 5% of their budgets or less; by contrast, 16.8% of the agencies contracted out 40% of their budgets or more.

The survey asked state agency heads to report their perceived effects of contracting out on two aspects of service delivery outcomes, service quality, and cost. In terms of service quality, agency heads tended to have a more favorable perception, with 49.4% of them reporting contracting out increased service quality, in contrast to 9.2% reporting decreased service quality and 35.4% reporting no quality difference. With regard to the perceived cost of delivering services, agency heads' perception was more split. A total of 34.5% of the agency heads considered contracting out to decrease the cost, while 28.8% reported increased costs, and 29.5% believed there is no cost difference.

The study further supplemented the ASAP data with sociodemographic data to explore the factors underlying the extent of contracting out by state agencies. Using a two-level hierarchical linear model (HLM), the study explores the state-level and agency-level factors that could explain the percentage of a state agency's budget allocated to contracting out. Specifically, these factors are categorized into eight groups: service supply and cost factors, public employee strength, political and ideological factors, fiscal factors, reform variables, agency leadership factors, agency attitude toward the expansion of budget, programs, and services, and service demand overload (Table 1). The regression results are reported in Table 3. To our knowledge, this study is one of the few studies that include such a wide range of factors, which provides a thorough evaluation of the antecedents of contracting out.

The main findings are twofold. First, agency-level factors play a more vital role than state-level factors in explaining the extent of contracting out by state agencies. In other words, contracting out is an agency-specific practice, which is mainly subject to the individual agency context. Second, contracting out is more pragmatically than ideologically driven. Agencies that experienced stronger fiscal stress, previous success with contracting, more reinventing/new public management reforms, more favorable attitudes toward budget expansion, and newer leadership contracted out more.

Overall, the study contributes significantly to the literature on government contracting. It provides a comprehensive examination of three key questions on government contracting, all of which are still being studied and debated by scholars in public administration (e.g., Alonso et al., 2016; Bel & Fageda, 2017; Lu & Hung, 2021; Petersen et al., 2018; Rho, 2013).

3 | RESEARCH DESIGN

Consistent with Brudney et al. (2005) ("the original study"), our main data came from the ASAP survey. ASAP was begun by Dr. Deil Wright of the University of North Carolina-Chapel Hill in 1964. The ASAP survey was run twice a

TABLE 1 Variable description.

	Brudney et al. (2005)		Replication					
Variable	**Measure**	**Level**	**1998 measure**	**Level**	**2004 measure**	**Level**	**2008 measure**	**Level**
Dependent variable								
contracting	Percentage of agency's budget allocated to contracting for delivery of services to the public	Agency	Percentage of agency's budget allocated to contracting for delivery of services to the public	Agency	Percentage of agency's budget allocated to contracting for delivery of services to the public	Agency	Percentage of agency's budget allocated to contracting for delivery of services to the public	Agency
Service supply and cost factors								
competition	Factor score for alternative suppliers/competition: Total service business establishments, population	State	Factor score for alternative suppliers/competition: Total service business establishments, population	State	Agency head rating: The extent of competition among the contract providers your agency uses	Agency	Agency head rating: The extent of competition among the contract providers your agency uses	Agency
costsav	Factor score for potential cost savings from privatization: Right to collective bargaining, ratio of average public sector salary to private service sector salary	State	Factor score for potential cost savings from privatization: Right to collective bargaining, ratio of average public sector salary to private sector salary	State	Factor score for potential cost savings from privatization: Right to collective bargaining, ratio of average public sector salary to private sector salary	State	Factor score for potential cost savings from privatization: Right to collective bargaining, ratio of average public sector salary to private sector salary	State
Public employee strength								
pubemplo	Factor score for public employee strength: Labor union coverage of public employees, right to strike, state governments FTE employment per 1000 population	State	Factor score for public employee strength: Labor union coverage of public employees, right to strike, state governments FTE employment per 1000 population	State	Factor score for public employee strength: Labor union coverage of public employees, right to strike, state governments FTE employment per 1000 population	State	Factor score for public employee strength: Labor union coverage of public employees, right to strike, state governments FTE employment per 1000 population	State

TABLE 1 (Continued)

	Brudney et al. (2005)		Replication					
Variable	**Measure**	**Level**	**1998 measure**	**Level**	**2004 measure**	**Level**	**2008 measure**	**Level**
Political and ideological factors								
citizpref	Factor score for citizen preferences: Percentage 65 years old and over, state spending on welfare, hospital, and health as percent of total state general expenditures, percentage of people below poverty level, citizen ideology	State	Factor score for citizen preferences: Percentage 65 years old and over, state spending on welfare, hospital, and health as percent of total state general expenditures, percentage of people below poverty level, citizen ideology	State	Factor score for citizen preferences: Percentage 65 years old and over, state spending on welfare, hospital, and health as percent of total state general expenditures, percentage of people below poverty level, citizen ideology	State	Factor score for citizen preferences: Percentage 65 years old and over, state spending on welfare, hospital, and health as percent of total state general expenditures, percentage of people below poverty level, citizen ideology	State
popblck	Percentage black population	State	Percentage black population	State	Percentage black population	State	Percentage black population	State
govideo	Factor score for government ideology: State government ideology and party of the governor	State	Factor score for government ideology: State government ideology and party of the governor	State	Factor score for government ideology: State government ideology and party of the governor	State	Factor score for government ideology: State government ideology and party of the governor	State
govcntrl	Governor's control over agency: z score of governor's involvement in appointment of agency head + z score of perceived governor's influence over agency budget, programs, major policy changes, and rules/regulations	Agency	Governor's control over agency: Average z score of: governor's involvement in appointment of agency head, perceived governor's influence over agency budget, programs, major policy changes, and rules/regulations	Agency	Governor's control over agency: Average z score of: governor's involvement in appointment of agency head, perceived governor's influence over agency budget, programs, major policy changes, and rules/regulations	Agency	Governor's control over agency: Average z score of: governor's involvement in appointment of agency head, perceived governor's influence over agency budget, programs, major policy changes, and rules/regulations	Agency

(Continues)

TABLE 1 (Continued)

	Brudney et al. (2005)		Replication					
Variable	**Measure**	**Level**	**1998 measure**	**Level**	**2004 measure**	**Level**	**2008 measure**	**Level**
agenideo	Agency head ideology: z score of agency head's self-rating on political party identification + z score on attitude on taxing and spending issues (liberal/conservative)	Agency	Agency head ideology: Average z score of: agency head's self-rating on political party identification, attitude on taxing and spending issues (liberal/conservative)	Agency	Agency head ideology: Average z score of: agency head's self-rating on political party identification, attitude on taxing and spending issues (liberal/conservative)	Agency	Agency head ideology: Average z score of: agency head's self-rating on political party identification, attitude on taxing and spending issues (liberal/conservative)	Agency
Fiscal factors								
fiscalrev	Factor score for revenue capacity: Two-year average median income of households, gross state product per capita, ratio of intergovernmental (IGR) revenue to total state revenue	State	Factor score for revenue capacity: Two-year average median income of households, gross state product per capita, ratio of intergovernmental (IGR) revenue to total state revenue	State	Factor score for revenue capacity: Two-year average median income of households, gross state product per capita, ratio of intergovernmental (IGR) revenue to total state revenue	State	Factor score for revenue capacity: Two-year average median income of households, gross state product per capita, ratio of intergovernmental (IGR) revenue to total state revenue	State
fiscaldemd	Factor score for demand for expenditures: Balanced budget requirement, fiscal need index by Tannenwald (1999)	State	Factor score for demand for expenditures: Balanced budget requirement, fiscal need index by Tannenwald (1999)	State	Factor score for demand for expenditures: Balanced budget requirement, change in legislature appropriation of agency's budget	State	Factor score for demand for expenditures: Balanced budget requirement, change in legislature appropriation of agency's budget	State
Reform variables								
reinvent	Number of reinventing- or new public management-type reforms adopted by the agency	Agency	Whether the agency's state experienced reforms of "reinventing government" or "redesigning government"	Agency	Whether the agency's state experienced reforms of "reinventing government" or "redesigning government"	Agency	Whether the agency's state experienced reforms of "reinventing government" or "redesigning government"	Agency

TABLE 1 (Continued)

	Brudney et al. (2005)		Replication					
Variable	**Measure**	**Level**	**1998 measure**	**Level**	**2004 measure**	**Level**	**2008 measure**	**Level**
prevcontra	Effect of previous experiences with contracting out on service quality and cost savings	Agency	Effect of previous experiences with contracting out on service quality and cost savings	Agency	Effect of previous experiences with contracting out on service quality and cost savings	Agency	Effect of previous experiences with contracting out on service quality and cost savings	Agency
perfund	Implementation of state performance funding	State	Implementation of state performance funding	State	N/A	N/A	Whether the agency and/or the agency's state use performance-based budgeting	State
gpphrgrd	Government Performance Project (GPP) grade in human resources	State	Government Performance Project (GPP) grade in human resources	State	Government Performance Project (GPP) grade in people	State	Government Performance Project (GPP) grade in people	State
Agency leadership factors								
tenure	Number of years as agency head	Agency	Number of years as agency head	Agency	Number of years as agency head	Agency	Number of years as agency head	Agency
education	Agency head's formal education	Agency	Agency head's formal education	Agency	Agency head's formal education	Agency	Agency head's formal education	Agency
experience	Agency head's years of experience in the private sector	Agency	Agency head's years of experience in the private sector	Agency	Agency head's years of experience in the private sector	Agency	Agency head's years of experience in the private sector	Agency
sectorpref	Agency head's advice to a young person to enter a career in the private sector rather than public sector	Agency	Agency head's advice to a young person to enter a career in the private sector rather than public sector	Agency	N/A	N/A	Agency head's advice to a young person to enter a career in the private sector rather than public sector	Agency

(Continues)

TABLE 1 (Continued)

	Brudney et al. (2005)		Replication					
Variable	**Measure**	**Level**	**1998 measure**	**Level**	**2004 measure**	**Level**	**2008 measure**	**Level**
Agency attitude toward budget expansion								
budgexpan	Factor score for agency expansion attitudes: Agency head's attitude toward expansion of state programs, services, and expenditures; agency programs and services; request for budget increase	Agency	Factor score for agency expansion attitudes: Agency head's attitude toward expansion of state programs, services, and expenditures; agency programs and services; request for budget increase	Agency	Factor score for agency expansion attitudes: Agency head's attitude toward expansion of state programs, services, and expenditures; agency programs and services; request for budget increase	Agency	Factor score for agency expansion attitudes: Agency head's attitude toward expansion of state programs, services, and expenditures; agency programs and services; request for budget increase	Agency
Service demand overload								
popchang	Population change over three-year period	State	Population change over three-year period	State	Population change over three-year period	State	Population change over three-year period	State
Control variables								
fedaction	Perceived effects (negative/positive) of federal actions on state agency (federal administrative regulations, mandates, statutory preemptions, federal court decisions)	Agency	Average z score of: Perceived effects (negative/positive) of federal actions on state agency (federal administrative regulations, mandates, statutory preemptions, federal court decisions)	Agency	Average z score of: Perceived effects (negative/positive) of federal actions on state agency (federal administrative regulations, mandates, statutory preemptions, federal court decisions)	Agency	Average z score of: Perceived effects (negative/positive) of federal actions on state agency (federal administrative regulations, mandates, statutory preemptions, federal court decisions)	Agency
agency	Dummy variables for each of 13 agency types	Agency	Dummy variables for each of 13 agency types	Agency	Dummy variables for each of 13 agency types	Agency	Dummy variables for each of the 13 agency types	Agency
budget	Size of agency budget	Agency	Logged size of agency budget	Agency	Logged size of agency budget	Agency	Logged size of agency budget	Agency

decade from 1964 to 2008 to collect data from leaders of major state agencies across all 50 American states on various topics related to state administration and policy, such as programs and performance, agency relationships, state-federal relations, and state-local issues (see Yackee and Yackee (2021) for more information about the ASAP survey and its administration). Thanks to the strenuous efforts of Yackee and Yackee (2021) in combining and cleaning the data, the ASAP data are currently publicly available for research. Given that survey questions related to government contracting only appeared in ASAP's 1998, 2004, and 2008 survey waves, we draw data from the 1998 wave for the narrow replication[i] and from the 2004 and 2008 waves for the wide replication. [ii]

To analyze the scope of contracting out, we use agency heads' responses to the following questions in both our narrow and wide replications:

Engagement in contracting out: "In recent years, some state agencies have used contracts (or contracting out) to outsource the delivery services to the public. Does your agency use such contracts?"

Percentage of budget allocated to contracting out: "Currently, about what percentage of your agency's budget is allocated to contracting for delivery of services to the public?"

The ASAP survey also asked respondents whether their agency contracts with different types of organizations, including other governments, non-profit organizations, and for-profit businesses. We use agency heads' responses to these questions to examine state agencies' major contracting partners.

In addition, we use the following questions from the ASAP survey to analyze agency heads' perceived effectiveness of previous contracting out experience:

"How has contracting out affected: The quality of services your agency delivers to the public?"

"How has contracting out affected: The cost of your agency of delivering services to the public?"

To examine the effect of different factors on the antecedents of contracting out, we use the aforementioned measure of budget allocation to contracting out as the outcome variable.

Following the original study, we collect both agency-level data from the ASAP survey and state- level sociodemographic data from various sources to create eight categories of explanatory variables. This ranges from Service Supply Cost Factors such as the level of competition to Fiscal Factors, including the demand for expenditures, and Control Variables in the form of agency types. In both our narrow and wide replications, we follow the original study in creating variables with either the original value, a factor score, or a summarization of z-scores.

For the narrow replication, every effort was made to ensure that our variables and their measurements were consistent with those in the original study. In our wide replication using data from 2004 and 2008, we supplement with alternative but substantively close data for several variables when the original measure was only available for 1998 but not later years. Several variables were further cleaned to ensure the appropriateness of the regression analysis. For example, several variables from the ASAP data were recoded, given that the original coding scheme was not fully compatible with our estimation approach.[iii] In addition, instead of using the sum of z-scores approach to create indices, as in the original study, we used average z-scores in the wide replication to retain the maximum number of observations and avoid potentially problematic operationalization.[iv] Table 1 details all the variables used in the replication compared to the ones in the original study. The appendix Table A1 reports the data source for each variable in the replication.[v]

Following the approach in the original study, in both narrow and wide replications, we use the following HLM with random state intercept and fixed slope to estimate the coefficients:

$$^{Y}ij^{=\gamma}00^{+\gamma}01^{W}1j^{+\cdots+\gamma}0n^{W}nj^{+\gamma}10^{X}1ij^{+\cdots+\gamma}n0^{X}nij^{+\mu}0j^{+\gamma}ij$$

where Y_{ij} is the outcome of interest (intensity of contracting out), *i* denotes agency as in the ASAP survey, *j* denotes the state to which each agency belongs, W_{1j} through W_{nj} are state-level covariates, X_{1ij} through X_{nij} are agency-specific features, and μ_{0j} is the state random intercept.

Coefficients are estimated with the maximum likelihood method, and *p*-values are calculated via Satterthwaite's degrees of freedom method.[vi]

4 | RESULTS

Following the original study, we focus on three questions: scope, perceived effectiveness, and antecedents. The replication results are as follows.

4.1 | Scope and perceived effectiveness of contracting out

Table 2 reports the scope and perceived effectiveness of contracting out in our data compared to the original study. For the narrow replication (1998), our findings are mostly consistent with those in the original study. For the wide replication (2004 and 2008), the results are also largely consistent, despite some minor differences. In sum, our replication concurs with the original study on the scope and perceived effectiveness of contracting out among the American states.

Specifically, with regard to the extent of use contracting out, there seems to be a slight overall high-level decrease, with 65% in 2004 and 63.5% in 2008 among the agencies reporting engagement in this practice in service delivery, down from over 70% in 1998. Among these agencies, the percentage of their budgets devoted to contracting continued to be modest in 2004 and 2008. Approximately one-third of the agencies allocated 5% or less of their budgets, while approximately 16% allocated 40% or more. Government-business contracting was still the most popular type of government contracting (over 80% of the agencies), followed by government–nonprofit contracting (nearly 70%) and government-government contracting (nearly 60%).

In terms of the effects of contracting out, compared with 1998, agency leaders' perceived effectiveness was still mixed. On the service quality side, 56% of the agencies in 2004 and 57.1% of the agencies in 2008 considered that contracting improved service quality, an increase from 49.4% in 1998. On the service delivery cost side, the percentage of agencies reporting that contracting out reduced service costs decreased from 34.5% in 1998 to 28.5% in 2004 and 28% in 2008. In other words, contracting out was perceived to be more effective in improving service quality than reducing service costs. This finding seems to concur with some previous studies in suggesting that cost savings from contracting out tend to decrease over time (Bel & Costas, 2006; Petersen et al., 2018). It is possible that contracting out was first implemented to take advantage of initial savings from external production. After these initial savings were gained, there was a decreasing marginal effect of contracting out on cost savings.[vii]

4.2 | Antecedents of contracting out

Table 3 reports our replication results with a comparison to the original results.[viii] First, we conducted a narrow replication using similar data from the same year (1998). The replication results are not perfectly aligned with the original results. On the one hand, similar to the original study, the narrow replication suggests that agencies with a more favorable attitude toward budget expansion and positive previous experience with contracting out (i.e., cost savings and quality improvement) allocated higher percentages of their budgets to service contracting. Both the replication and original results are also consistent in showing that political and ideological factors do not strongly shape the use of contracting out. Put together, contracting out is used as a pragmatic tool to improve outcomes and expand programs, rather than a response to political dynamics. Moreover, the replication results concur with the original results in finding out that some agencies (i.e., economic development, environment and energy, health, income security and social services, non-fiscal staff, and transportation) contracted out more than others, although the findings concerning specific agencies are not exactly the same. Despite the differences, both results indicate that contracting out is an agency-specific practice. On the other hand, the narrow replication results are different from the original results in two ways. First, the replication results do not indicate a significant effect of reinventing/new public management reforms, agency leaders' tenure, fiscal capacity, or fiscal demand. In particular, the replication does not support the

argument in the original study that contracting out is used to cope with fiscal stress. Second, the replication adds that larger agencies (measured by their budget sizes in logarithmic forms) contracted out more.

We note that the results from our narrow replication are not fully consistent with the original study. This might arise because several important empirical decisions that would affect the estimation results were not stated in the original study, which prevents us from replicating the original study more closely. First, several different methods exist for evaluating statistical significance in mixed models (Luke, 2017), and our choice of applying the Satterthwaite approximation might not be the same as the approach applied in the original study. Another main reason for the different results is how explanatory variables are operationalized for the analysis, as discussed in the previous section, including recoding ASAP variables before calculating factor scores, summarizing z-scores, etc. Lastly, although we made every effort to use consistent measures as the original study, in some rare cases the same variable is not available. For example, while the original study measured *reinvent* with "number of reinventing- or new public management-type reforms adopted by the agency," the closest variable we can find from the ASAP survey is a binary measure of such reforms, which might explain why we fail to find a positive and significant effect of *reinvent* as the original study did.

Next, we conducted a wide replication using pooled cross-sectional data from more recent years (2004 and 2008). Note that the key questions on government contracting are only available in the 1998, 2004, and 2008 waves of the ASAP survey, therefore we were only able to replicate the original findings for these 3 years.[ix] First, we replicated the original study with data from more recent years, using the same multi-level modeling approach with state random effects, and the results are shown in Column (3) of Table 3. Next, in Column (4), we controlled for year fixed effects to account for the two different survey waves and any year-specific effects. Lastly, we used an alternative two-way fixed effects approach with state and year fixed effects to address further potential omitted variable bias arising from time-invariant factors at the state level. The results are reported in Column (5) of Table 3.

The replication results also present interesting findings. Similar to the original study, the wide replication finds that agencies with favorable previous experience in contracting out (i.e., quality improvement) and experiencing reinventing/new public management reforms contracted out service delivery more. Again, political and ideological factors do not play a significant role in driving contracting out, suggesting contracting out is less politically and ideologically motivated. The wide replication also largely aligns with the original study in suggesting that certain agencies

TABLE 2 Scope and perceived effectiveness of contracting out.

		Replication		
	Brudney et al. (2005)	1998	2004	2008
Engagement in contracting	72.5	73.3	65	63.5
Contracting as % of agency budget: 5% or less	33.3	33	34.4	31
Contracting as % of agency budget: 40% or more	16.8	16.8	16.1	16.4
Contract with: other governments	61.1	61.1	58.4	58.2
Contract with: nonprofit organizations	71	71	68.3	71
Contract with: for-profit businesses	82.9	83.2	85.9	80.9
Effect on quality: no effect	35.4	35.4	38.1	33.4
Effect on quality: increased	49.4	49.4	56	57.1
Effect on quality: decreased	9.2	9.2	6	9.5
Effect on cost: no effect	29.5	29.5	36.7	32.9
Effect on cost: increased	28.8	28.8	34.8	39.1
Effect on cost: decreased	34.5	34.5	28.5	28

Note: all the numbers in the table are percentage values.

TABLE 3 Regression results.

	(1) Original study (1998)	(2) Narrow replication (1998)	(3) Wide replication (2004 & 2008)	(4) Wide replication with year FE (2004 & 2008)	(5) Wide replication with two-way FE (2004 & 2008)
budgexpan	0.2276***	0.1010*	0.0451	0.0450	0.0314
	(<0.0001)	(0.0618)	(0.2750)	(0.2756)	(0.4724)
govcntrl	0.0062	−0.0135	0.0600	0.0614	0.0614
	(0.8573)	(0.8390)	(0.2885)	(0.2762)	(0.3209)
agenideo	−0.0211	−0.0375	0.0247	0.0248	0.0357
	(0.5435)	(0.5115)	(0.5693)	(0.5666)	(0.4597)
fedaction	−0.0062	0.0100	−0.0594	−0.0629	−0.0523
	(0.7846)	(0.8624)	(0.2195)	(0.1927)	(0.3140)
budget	0.0000	0.1025***	0.0420**	0.0351**	0.0434**
	(0.7854)	(0.0001)	(0.0153)	(0.0459)	(0.0209)
prevcontra_combined	0.5802***				
	(<0.0001)				
prevcontra_quality = Decreased		0.0072	0.1529	0.1388	0.0691
		(0.9627)	(0.2761)	(0.3225)	(0.6422)
prevcontra_quality = Increased		0.1536*	0.1798**	0.1783**	0.1502*
		(0.0881)	(0.0183)	(0.0190)	(0.0624)
prevcontra_cost = Decreased		0.1705*	−0.0747	−0.0800	−0.0796
		(0.0967)	(0.3959)	(0.3621)	(0.3888)
prevcontra_cost = Increased		0.0763	0.1210	0.1117	0.1147
		(0.4817)	(0.1544)	(0.1881)	(0.1982)
experience	−0.0055	−0.0039	0.0017	0.0016	−0.0007
	(0.4226)	(0.6612)	(0.8400)	(0.8477)	(0.9330)
tenure	−0.0180*	0.0086	−0.0050	−0.0055	−0.0072
	(0.0751)	(0.3356)	(0.4515)	(0.4086)	(0.3138)
education	0.0118	0.0681	0.0111	0.0137	0.0065
	(0.8273)	(0.1285)	(0.7766)	(0.7272)	(0.8771)
sectorpref	0.0684	0.0540			
	(0.2246)	(0.5323)			
reinvent	0.0199**	0.0487	0.1397*	0.1493**	0.1805**
	(0.0109)	(0.6140)	(0.0534)	(0.0390)	(0.0242)
agency: Staff-Non Fiscal		0.4745*	0.3580	0.3852	0.2247
		(0.0775)	(0.1659)	(0.1356)	(0.4080)
agency: Income security and social services	0.9937***	0.7283***	0.5941***	0.6350***	0.5443**
	(0.0022)	(0.0050)	(0.0033)	(0.0018)	(0.0113)
agency: Health	2.2481***	1.6889***	1.0101***	1.0484***	0.9774***
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
agency: Environment and energy		0.4554*	−0.2284	−0.1852	−0.2041
		(0.0874)	(0.2848)	(0.3872)	(0.3650)

TABLE 3 (Continued)

	(1) Original study (1998)	(2) Narrow replication (1998)	(3) Wide replication (2004 & 2008)	(4) Wide replication with year FE (2004 & 2008)	(5) Wide replication with two-way FE (2004 & 2008)
agency: Economic development		0.6682**	0.1211	0.1434	0.0513
		(0.0120)	(0.5960)	(0.5297)	(0.8313)
agency: Transportation	1.2365***	0.6083**	0.3837*	0.4309**	0.3103
	(0.0003)	(0.0207)	(0.0796)	(0.0499)	(0.1818)
competition	−0.0462	−0.0498	0.0528	0.0663*	0.0670*
	(0.4792)	(0.3078)	(0.1205)	(0.0556)	(0.0680)
costsav	0.0821	−0.0704	−0.0153	−0.0214	−0.4873
	(0.2936)	(0.3699)	(0.8226)	(0.7537)	(0.3054)
fiscalrev	−0.1293*	0.0431	−0.0059	−0.0023	0.0970
	(0.0986)	(0.4260)	(0.8814)	(0.9537)	(0.7792)
fiscaldemd	0.1223*	0.1116	−0.1646	−0.1644	−0.3318
	(0.0740)	(0.4943)	(0.3788)	(0.3780)	(0.2075)
citizpref	0.0465	0.0993	0.0534	0.0508	−0.3328
	(0.5328)	(0.1248)	(0.3101)	(0.3334)	(0.5531)
govideo	−0.1003	0.0527	−0.0296	−0.0307	−0.0511
	(0.1771)	(0.3908)	(0.4418)	(0.4237)	(0.3351)
pubemplo	0.0804	0.0468	−0.0053	−0.0080	0.4638
	(0.3655)	(0.3732)	(0.8810)	(0.8221)	(0.8254)
popchang	0.0176	2.8814	0.7267	0.4569	−1.7004
	(0.5271)	(0.1468)	(0.6664)	(0.7865)	(0.7289)
popblck	0.0038	−0.6110	−0.2593	−0.2659	−6.4887
	(0.5790)	(0.2740)	(0.5801)	(0.5696)	(0.7728)
perfund	0.1282	0.0705			
	(0.3426)	(0.5392)			
gpphrgrd	0.0388	0.0312	−0.0312	−0.0376*	−0.0498
	(0.2486)	(0.2451)	(0.1160)	(0.0607)	(0.4971)
State random effects	Yes	Yes	Yes	Yes	No
State fixed effects	No	No	No	No	Yes
Year fixed effects	No	No	No	Yes	Yes
Observations	Not reported	472	752	752	752

Note: The dependent variable is the level of the agency's budget allocated to contracts for delivering services to the public. Replication results from the linear mixed model with *t*-tests using Satterthwaite's method. *P*-values reported in parentheses. The table includes only those agency dummy variables that are significant at $p < 0.1$.

*** $p < 0.01$;

** $p < 0.05$;

* $p < 0.1$.

(health, income security, and social services, transportation) contracted out more than others, indicating the agency-specific nature of contracting out. In addition, the wide replication results differ from the original results in two main respects. First, the wide replication does not find that an agency's attitude toward budget expansion, agency leaders' tenure, fiscal capacity, or fiscal demand has a significant effect on shaping contracting out. In particular, the same as the narrow replication, we do not find support for contracting out as a response to fiscal stress. Second, the wide replication finds that agencies with larger budgets contracted out more, again consistent with the narrow replication though not significant in the original study. Our findings support existing literature on this effect, such as Ni and Bretschneider (2007) and Hefetz et al. (2012).

5 | DISCUSSION AND CONCLUSION

This manuscript replicates the results of Brudney et al. (2005) in both a narrow and wide sense. The original results are largely robust to an increase in the sample period from 1998 to 2004 and 2008 concerning the scope and perceived effectiveness of contracting out. Together, both the original study and the replication suggest that contracting out is a widespread government tool used by state agencies in the United States in the delivery of public services.

However, both studies also indicate that the effectiveness of contracting out is actually perceived to be quite mixed and controversial. These two findings delineate an interesting picture of the use of government contracting in public administration. On the one hand, it is widely used; on the other hand, it has no clear evidence suggesting its effectiveness. As Kelman (2002, p. 315) wrote, "contracting is almost universally viewed as a highly legitimate tool for accomplishing public purposes," despite the lack of clear consensus about its effectiveness. Similar empirical results can be found in other studies (e.g., Bel et al., 2010; Petersen et al., 2018).

Regarding the antecedents of contracting out by state agencies, the replication concurs with the original study on many grounds, but it also adds new nuances. Overall, the main takeaways from the original study and the replication are consistent in two areas. First, contracting out is an agency-specific practice shaped more by individual agency contexts than by broader state sociodemographics. In other words, public managers, at least at the state level, use contracting as a tool in response to their individual organizational contexts, rather than broader social contexts. To understand government contracting, we need to bring agency contexts into consideration. Second, contracting out is driven more by pragmatic factors than ideological and political factors. Indeed, whether and to what extent contracting out is driven by ideological and political motives is a highly contested topic in the literature. Some studies suggest that ideological and political motives forcefully shape government contracting out decisions (e.g., Alonso et al., 2016; Alonso et al., 2022; Lu, 2013; Ni & Bretschneider, 2007), while others suggest that contracting out as a pragmatic response to challenges in service delivery and political-ideological factors have no apparent influence (e.g., Bel & Fageda, 2007; Kim & Warner, 2016; Petersen et al., 2015). Our results indicate that ideological and political factors do not have a significant effect on the levels of contracting out in state agencies. In other words, our results support the body of literature suggesting contracting out as a pragmatic government tool.

Specifically, the effects of individual antecedents show some divergences between the original study and the replication. For example, the original study finds that agencies with weaker revenue capacity and greater fiscal demands contracted out more, but our replication fails to observe the significant effects of these fiscal factors. These different results could be due to the slight differences in data and variable measurements, but they may also imply the dynamics and complexity of contracting out (Bel & Fageda, 2017; Hefetz & Warner, 2004; Tadelis, 2002). There is no single pattern underlying the use of contracting out, and thus, no single factor could determine contracting out under all circumstances. Rather, contracting is a dynamic practice used by agencies to serve pragmatic needs for certain contingencies.

In summary, although our replication largely echoes the findings of the original study, it by no means indicates that this strand of research will not advance with breakthroughs. As a matter of fact, we call for further research investigating the determinants of contracting out in at least two ways. First, while we made progress with pooled

data compared to the cross-sectional survey data in the original study, we believe that the explosion in datasets these days, particularly big data, allows researchers to test more profound and wider when more recent and nuanced datasets become available. Second, we follow the original study with the HLM for our replication, but future advances in econometric tools should also render more rigorous and robust estimations. Further research is encouraged to identify and estimate the fundamental causal factors driving the decision to contract out, given the advances in datasets and estimation tools. Third, existing studies on contracting out determinants are preoccupied with the individual effects of geographic, institutional, and organizational factors without examining how these factors moderate the relationships. Some factors may matter in certain contexts rather than others. It is thus interesting to explore the conditions under which these factors shape contracting out.

Finally, the academic community has become increasingly interested in open research and replication. As our study represents an early replication attempt in the field of public administration, our replication effort reinforces the importance of accurate and complete reporting in original studies for future academic use and replication. We recommend that original studies carefully consider the transparency and reporting of their research design, methods, and data analysis, when applicable. In particular, authors are recommended to consult recognized research reporting standards and practices as appropriate (e.g., Aguinis et al., 2021; APA Publications and Communications Board Working Group on Journal Article Reporting Standards, 2008; Mele et al., 2020; Von Elm et al., 2007).

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DATA AVAILABILITY STATEMENT

The data from The American State Administrators Project are available upon request at https://asap.wisc.edu/. The rest of the data and codes are openly available in Harvard Dataverse at: https://doi.org/10.7910/DVN/TMVUAN.

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ENDNOTES

[i] We cannot verify whether the 1998 data we have access to are perfectly the same as the data used in the original study, although we expect both data to be highly consistent.

[ii] The 2004 survey received 941 respondents from 3,245 possible respondents (a response rate of 29%), and the 2008 survey received 713 respondents from 3,565 possible respondents (a response rate of 20%).

[iii] For example, the original coding scheme for the variable *prevcontra* (effect of previous contracting on service quality) was: 0-No effect, 1-Increased, 2-Decreased, 3-Do not know. We recoded the variable to set "Do not know" responses as NA, and treated the variable as a factor variable with "No effect" as the baseline level.

[iv] When using the sum of z-scores, we might either 1) lose many observations if missing values appear in at least one of the variables used to calculate the index (assuming missing values are not removed), or 2) create problematic indices in summing up the z-scores if missing values are removed (thus treated as 0).

[v] Please note that the original study did not report the data sources for many state-level variables. As a result, we could not compare our data sources with the ones in the original study.

[vi] Implemented with R package "lmertest," version 3.1–3. Available at https://cran.r-project.org/web/packages/lmerTest/index.html, last accessed January 13, 2022.

[vii] We thank an anonymous reviewer for this observation.

[viii] Given the space limit and long variable list, following the original study, we will focus on the interpretation of regression results related to the main findings.

[ix] Please note that the variable measures in 1998 and the ones in 2004 and 2008 are not exactly the same (see the details in Table 1), as we could not run the analysis using data combining those 3 years.

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APPENDIX A

TABLE A1 Data sources for replication.

Variable	1998 measure	Data source(s)	2004 measure	Data source(s)	2008 measure	Data source(s)
Dependent variable						
contracting	Percentage of agency's budget allocated to contracting for delivery of services to the public	1998 ASAP	Percentage of agency's budget allocated to contracting for delivery of services to the public	2004 ASAP	Percentage of agency's budget allocated to contracting for delivery of services to the public	2008 ASAP
Service supply and cost factors						
competition	Factor score for alternative suppliers/ competition: Total service business establishments, population	U.S. Census Statistics of U.S. Businesses, U.S. Census State Intercensal Tables	Agency head rating: The extent of competition among the contract providers your agency uses	2004 ASAP	Agency head rating: The extent of competition among the contract providers your agency uses	2008 ASAP
costsav	Factor score for potential cost savings from privatization: Right to collective bargaining, ratio of average public sector salary to private sector salary	Sanes and Schmitt (2014), U.S. Census Annual Survey of Public Employment & Payroll	Factor score for potential cost savings from privatization: Right to collective bargaining, ratio of average public sector salary to private sector salary	Sanes and Schmitt (2014), U.S. Census Annual Survey of Public Employment & Payroll	Factor score for potential cost savings from privatization: Right to collective bargaining, ratio of average public sector salary to private sector salary	Sanes and Schmitt (2014), U.S. Census Annual Survey of Public Employment & Payroll
Public employee strength						
pubemplo	Factor score for public employee strength: Labor union coverage of public employees, right to strike, state governments FTE employment per 1000 population	Hirsch and Macpherson (2003), Sanes and Schmitt (2014), U.S. Census Annual Survey of Public Employment & Payroll, U.S. Census State Intercensal Tables	Factor score for public employee strength: Labor union coverage of public employees, right to strike, state governments FTE employment per 1000 population	Hirsch and Macpherson (2003), Sanes and Schmitt (2014), U.S. Census Annual Survey of Public Employment & Payroll, U.S. Census State Intercensal Tables	Factor score for public employee strength: Labor union coverage of public employees, right to strike, state governments FTE employment per 1000 population	Hirsch and Macpherson (2003), Sanes and Schmitt (2014), U.S. Census Annual Survey of Public Employment & Payroll, U.S. Census State Intercensal Tables

TABLE A1 (Continued)

Variable	1998 measure	Data source(s)	2004 measure	Data source(s)	2008 measure	Data source(s)
Political and ideological factors						
citizpref	Factor score for citizen preferences: Percentage 65 years old and over, state spending on welfare, hospital, and health as percent of total state general expenditures, percentage of people below poverty level, citizen ideology	Berry et al. (1998), U.S. Census Small Area Income and Poverty Estimates, U.S. Census Annual survey of state government finances, U.S. Census state Intercensal tables	Factor score for citizen preferences: Percentage 65 years old and over, state spending on welfare, hospital, and health as percent of total state general expenditures, percentage of people below poverty level, citizen ideology	Berry et al. (1998), U. S. Census Annual Survey of State Government Finances, U.S. Census state Intercensal tables	Factor score for citizen preferences: Percentage 65 years old and over, state spending on welfare, hospital, and health as percent of total state general expenditures, percentage of people below poverty level, citizen ideology	Berry et al. (1998), U. S. Census Annual Survey of State Government Finances, U.S. Census State Intercensal Tables
popblck	Percentage black population	U.S. Census State Intercensal Tables	Percentage black population	U.S. Census State Intercensal Tables	Percentage black population	U.S. Census State Intercensal Tables
govideo	Factor score for government ideology: State government ideology and party of the governor	Berry et al. (1998), Kaplan (2021)	Factor score for government ideology: State government ideology and party of the governor	Berry et al. (1998), Kaplan (2021)	Factor score for government ideology: State government ideology and party of the governor	Berry et al. (1998), Kaplan (2021)
govcntrl	Governor's control over agency: Average z score of: governor's involvement in appointment of agency head, perceived governor's influence over agency budget, programs, major policy changes, and rules/ regulations	1998 ASAP	Governor's control over agency: Average z score of: governor's involvement in appointment of agency head, perceived governor's influence over agency budget, programs, major policy changes, and rules/regulations	2004 ASAP	Governor's control over agency: Average z score of: governor's involvement in appointment of agency head, perceived governor's influence over agency budget, programs, major policy changes, and rules/regulations	20,088 ASAP

(Continues)

TABLE A1 (Continued)

Variable	1998 measure	Data source(s)	2004 measure	Data source(s)	2008 measure	Data source(s)
agenideo	Agency head ideology: Average z score of: agency head's self-rating on political party identification, attitude on taxing and spending issues (liberal/conservative)	1998 ASAP	Agency head ideology: Average z score of: agency head's self-rating on political party identification, attitude on taxing and spending issues (liberal/conservative)	2004 ASAP	Agency head ideology: Average z score of: agency head's self-rating on political party identification, attitude on taxing and spending issues (liberal/conservative)	2008 ASAP
Fiscal factors						
fiscalrev	Factor score for revenue capacity: Two- year average median income of households, gross state product per capita, ratio of intergovernmental (IGR) revenue to total state revenue	U.S. Bureau of Economic Analysis GDP by State, U.S. Census Annual Survey of State Government Finances, U.S. Census Small area income and poverty estimates	Factor score for revenue capacity: Two- year average median income of households, gross state product per capita, ratio of intergovernmental (IGR) revenue to total state revenue	U.S. Bureau of Economic Analysis GDP by State, U.S. Census Annual Survey of State Government Finances, U.S. Census Small area income and poverty estimates	Factor score for revenue capacity: Two- year average median income of households, gross state product per capita, ratio of intergovernmental (IGR) revenue to total state revenue	U.S. Bureau of Economic Analysis GDP by State, U.S. Census Annual Survey of State Government Finances, U.S. Census Small area income and poverty estimates
fiscaldemd	Factor score for demand for expenditures: Balanced budget requirement, fiscal need index by Tannenwald (1999)	National Conference of State Legislatures (2010), Tannenwald (1999)	Factor score for demand for expenditures: Balanced budget requirement, change in legislature appropriation of agency's budget	National Conference of State Legislatures (2010), 2004 ASAP	Factor score for demand for expenditures: Balanced budget requirement, change in legislature appropriation of agency's budget	National Conference of State Legislatures (2010), 2008 ASAP
Reform variables						
reinvent	Whether the agency's state experienced reforms of "reinventing government" or "redesigning government"	1998 ASAP	Whether the agency's state experienced reforms of "reinventing government" or "redesigning government"	2004 ASAP	Whether the agency's state experienced reforms of "reinventing government" or "redesigning government"	2008 ASAP

TABLE A1 (Continued)

Variable	1998 measure	Data source(s)	2004 measure	Data source(s)	2008 measure	Data source(s)
prevcontra	Effect of previous experiences with contracting out on service quality and cost savings	1998 ASAP	Effect of previous experiences with contracting out on service quality and cost savings	2004 ASAP	Effect of previous experiences with contracting out on service quality and cost savings	2008 ASAP
perfund	Implementation of state performance funding	Jordan and Hackbart (1999)	N/A	N/A	Whether the agency and/or the agency's state use performance-based budgeting	2008 ASAP
gpphrgrd	Government Performance Project (GPP) grade in human resources	Barrett and Greene (1999)	Government Performance Project (GPP) grade in people	Government Performance Project (2005)	Government Performance Project (GPP) grade in people	Barrett and Greene (2008)
Agency leadership factors						
tenure	Number of years as agency head	1998 ASAP	Number of years as agency head	2004 ASAP	Number of years as agency head	2008 ASAP
education	Agency head's formal education	1998 ASAP	Agency head's formal education	2004 ASAP	Agency head's formal education	2008 ASAP
experience	Agency head's years of experience in the private sector	1998 ASAP	Agency head's years of experience in the private sector	2004 ASAP	Agency head's years of experience in the private sector	2008 ASAP
Sectorpref	Agency head's advice to a young person to enter a career in the private sector rather than public sector	1998 ASAP	N/A	N/A	Agency head's advice to a young person to enter a career in the private sector rather than public sector	2008 ASAP

(Continues)

TABLE A1 (Continued)

Variable	1998 measure	Data source(s)	2004 measure	Data source(s)	2008 measure	Data source(s)
Agency attitude toward budget expansion						
budgexpan	Factor score for agency expansion attitudes: Agency head's attitude toward expansion of state programs, services, and expenditures; agency programs and services; request for budget increase	1998 ASAP	Factor score for agency expansion attitudes: Agency head's attitude toward expansion of state programs, services, and expenditures; agency programs and services; request for budget increase	2004 ASAP	Factor score for agency expansion attitudes: Agency head's attitude toward expansion of state programs, services, and expenditures; agency programs and services; request for budget increase	2008 ASAP
Service demand overload						
popchang	Population change over three-year period	U.S. Census State Intercensal Tables	Population change over three-year period	U.S. Census State intercensal tables	Population change over three-year period	U.S. Census State intercensal tables
Control variables						
fedaction	Average z score of: Perceived effects (negative/positive) of federal actions on state agency (federal administrative regulations, mandates, statutory preemptions, federal court decisions)	1998 ASAP	Average z score of: Perceived effects (negative/positive) of federal actions on state agency (federal administrative regulations, mandates, statutory preemptions, federal court decisions)	2004 ASAP	Average z score of: Perceived effects (negative/positive) of federal actions on state agency (federal administrative regulations, mandates, statutory preemptions, federal court decisions)	2008 ASAP
agency	Dummy variables for each of 13 agency types	1998 ASAP	Dummy variables for each of 13 agency types	2004 ASAP	Dummy variables for each of 13 agency types	2008 ASAP
budget	Logged size of agency budget	1998 ASAP	Logged size of agency budget	2004 ASAP	Logged size of agency budget	2008 ASAP

Note: N/A means not available.