Speaking, Thinking, and Being President
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Online Appendix

Basic model

President's time budget is equal to B, $0 \leq B \leq 24$, which is divided between thinking (t) and speaking (s) represented by non-negative real numbers. The set of all allocations of President's time is a triangle

$$\mathbb{T} = \{(t,s): t \geq 0 \,\&\, s \geq 0 \,\&\, t + s \leq 24\} \quad (1)$$

The value of different allocations is given by a real-valued utility function $U: \mathbb{T} \to \mathbb{R}$, which is assumed to be twice differentiable and strictly increasing both in t and s. Moreover, we assume that the level sets of U are convex. A popular example of a utility function of a maximizing consumer that satisfies our assumptions in the interior of $\mathbb{T}$ is the Cobb-Douglas function, i.e., $U(t,s) = t^{\lambda 1} s^{\lambda 2}$ with a common constraint that the positive parameters λ_1, λ_2 satisfy $\lambda_1 + \lambda_2 = 1$. While using a specific utility function simplifies calculations, we do not need to impose any constraints on $U(t,s)$.

Our assumptions guarantee that the level sets (indifference curves) have familiar shapes and that they are "thin" (see Figure 1). Optimal allocation of time B is obtained by solving the maximization problem:

$$\max_{(t,s)\in\mathbb{T}:\, s+t=B} U(t,s) \quad (2)$$

Priority and Circumstances Hypotheses

Our assumptions imply that for every B, there is exactly one solution to the maximization problem, which is denoted below by (t^*, s^*). For a specific U_1, we call the set of all such solutions the "time expansion path" for U_1 and denote it π_1:

$$\pi_1 = \left\{(t^*, s^*) \in \mathbb{T}: \exists B \; s.t. \; 0 \leq B \leq 24 \,\&\, \operatorname*{argmax}_{(t,s)\in\mathbb{T}:\, t+s=B} U_1(t,s) = (t^*, s^*)\right\} \quad (3)$$

Continuity of U implies that π is a continuous curve connecting point (0,0) with the line demarcating the maximal budget $B_{24} = \{(t,s) \in \mathbb{T}: t + s = 24\}$.

For two utility functions U_1 and U_2, the corresponding path π_1 *s-dominates* path π_2 if for the same positive budget $B > 0$, the optimal amount of speaking is always greater for U_1 than for U_2. Formally:

$$\pi_1 \succ_s \pi_2 \Leftrightarrow \forall B \; s.t. \; 0 < B \leq 24, [\pi_1(B) = (t_1^*, s_1^*) \,\&\, \pi_2(B) = (t_2^*, s_2^*)] \Rightarrow s_1^* > s_2^* \quad (4)$$

Of course, $s_1^* > s_2^*$ implies $t_1^* < t_2^*$, which means that $\pi_1 \succ_s \pi_2$ implies $\pi_2 \succ_t \pi_1$, where the relation of *t-domination* $\succ_t$ is defined analogously to *s-domination*.

Both Priority and Circumstances Hypotheses stipulate that prioritizing policy will produce time expansion paths that t-dominate the initial paths. The assumptions of both hypotheses are formulated as empirical conditions using variables from outside our mode; we can define those two empirical conditions E_1 and E_2 in the following way:

E_1: If P_1 prefers policy to publicity versus P_2
E_2: If circumstances C_1 prioritize policy to publicity versus C_2

Then we can write down both hypotheses in formal terms:

Priority Hypothesis: $E_1 \Rightarrow \pi_1 \succ_t \pi_2$
Circumstances Hypothesis: $E_2 \Rightarrow \pi_1 \succ_t \pi_2$

Stamina Hypothesis

In microeconomic theory, when income (budget) increases over some interval, a good whose consumption increases (decreases) at this interval is called *normal* (*inferior*). Stamina Hypothesis stipulates that both t^* and s^* increase with B, i.e., both t and s are normal goods for the entire interval $[0, 24]$, i.e., path π can be represented as an increasing function $s^*(t)$ as well as $t^*(s)$:

$$[B_1 < B_2 \,\&\, \pi(B_1) = (t_1^*, s_1^*) \,\&\, \pi(B_2) = (t_2^*, s_2^*)] \Longrightarrow (t_1^* < t_2^* \,\&\, s_1^* < s_2^*) \qquad (5)$$

A hypothetical President for whom s (or t) were inferior good over the interval $[B_1, B_2]$, would spend less time on speaking (thinking) with the increase of his time budget from B_1 to B_2.

Model with thinking efficiency

When a president P_1 with a time budget B is a more efficient thinker than a "standard" thinker P_2, we can represent this situation by assuming the lower "price of thinking output" for P_1, i.e., P_1's "effective thinking output" is equal to $\tau = t/p$, where $0 < p \leq 1$ is a new parameter representing the price of thinking measured in actual time compared with the "standard" price of 1. The set of all allocations of P_1's time expressed in terms of speaking and effective thinking is defined as follows:

$$\mathbb{T}^p = \{(\tau, s): \tau \geq 0 \,\&\, s \geq 0 \,\&\, p\tau + s \leq 24\} \qquad (6)$$

The utility function is now defined for all p as $U^p: \mathbb{T}^p \to \mathbb{R}$ with the same properties as earlier and for each p, P_1's maximization problem is defined by the condition

$$\max_{(\tau,s)\in\mathbb{T}^p:\, s+p\tau=B} U^p(\tau,s) \tag{7}$$

Finally, the time expansion path for U^p is defined as:

$$\pi^p = \left\{(\tau^*,s^*)\in\mathbb{T}^p: \exists B\ s.t.\ 0\le B\le 24\ \&\ \operatorname*{argmax}_{(\tau,s)\in\mathbb{T}^p:\, s+p\tau=B} U^p(\tau,s)=(\tau^*,s^*)\right\} \tag{8}$$

Efficiency Hypothesis

In microeconomic theory, a good such that a decrease in its price implies a higher (lower) consumption is called *ordinary* (*Giffen*). Giffen goods are very rare but theoretically possible. In our context, a Giffen thinking would arise when lowering p would decrease the time spent on thinking. The Efficiency Hypothesis states that President's thinking is an ordinary good for the entire interval $[0,24]$ and all $0<p<1$.

Let $U:\mathbb{T}\to\mathbb{R}$ and $U^p:\mathbb{T}^p\to\mathbb{R}$. Formally, the Efficiency Hypothesis says that:

$$[0<p<1\ \&\ \pi(B)=(t_1^*,s_1^*)\ \&\ \pi^p(B)=(\tau_2^*,s_2^*)]\Longrightarrow p\tau_2^*>t_1^* \tag{9}$$

We can reformulate (9): if $\pi'=\{(p\tau_2^*,s_2^*):(\tau_2^*,s_2^*)\in\pi^p\}$, i.e., if the τ-coordinate in the time expansion path π^p is contracted by the factor of p, π' t-dominates π: $\pi'\succ_t\pi$.

Robustness Check

Contacts Model III + "Peace" and "Prosperity" Controls

```
nbreg top presdum honey reelect lame durhour pubeventsucsb outsidedc fatal rgdpqr if
nowork==0 & missing==0, r cl(month)
```

top	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
presdum	-.1665097	.0844066	-1.97	0.049	-.3319436	-.0010758
honey	-.0489024	.0466465	-1.05	0.294	-.1403278	.042523
reelect	-.3345	.1286723	-2.60	0.009	-.586693	-.082307
lame	-.759789	.0973946	-7.80	0.000	-.950679	-.568899
durhours	.0260128	.0098979	2.63	0.009	.0066134	.0454123
pubeventsucsb	-.0038674	.0234469	-0.16	0.869	-.0498225	.0420877
outsidedc	-.3687527	.0562318	-6.56	0.000	-.4789649	-.2585405
fatal	**.0000338**	**.000631**	**0.05**	**0.957**	**-.001203**	**.0012706**
rgdpqr	**.050329**	**.0216028**	**2.33**	**0.020**	**.0079883**	**.0926698**
_cons	1.101183	.1840277	5.98	0.000	.7404955	1.461871
/lnalpha	-1.164287	.1543425			-1.466793	-.8617809
alpha	.3121452	.0481773			.2306641	.4224091

Dependent Variable: The President's total number of 5+ minute contacts (in person or by phone) with seven key officials in his administration – i.e., National Security Advisor; Vice President, Secretaries of State, Treasury, and Defense; Attorney General; and CIA Director – during workdays from January 20, 1977 through January 19, 1985.

[1] Analysis excludes weekends, federal holidays, and days with missing records.
[2] Standard Errors adjusted for clustering on month.

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This table accompanies the discussion for Table 1, Model 3, especially the extension in footnote 13. To review, here are the model 3 results with two additional variables: "war" (i.e., the number of combat fatalities during each quarter, labeled as "fatal") and "prosperity" (i.e., the percent change in real gross domestic income during each quarter, seasonally adjusted, labeled as "rgdpqr").

Neither new variable is especially correlated with presidential contacts (r = .07 for military fatalities, r = .04 for economic growth), and adding them to the multiple regression model does not meaningfully affect the other coefficients, standard errors, or significance tests.

We did not have a strong expectation about the relationship between economic growth and "thinking" activities for the time horizon under study, though all we generally suspect a recession would precipitate more meetings. This result here suggests the opposite – i.e., presidents engage officials more when the economy is growing. We remain dubious, in part because of the bivariate correlation does suggests a modest relationship , which is why choose not to emphasize it and instead leave it as a topic ripe for future research and data better suited to test this point.

Robustness Check

Public Model III + "Peace" and "Prosperity" Controls

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nbreg pubeventsucsb presdum honey reelect lame durhour top outsidedc fatal rg if
nowork==0 & missing==0, r cl(month)
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pubeventsucsb	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
presdum	.2996978	.0809482	3.70	0.000	.1410422	.4583534
honey	-.1393267	.1079865	-1.29	0.197	-.3509763	.0723229
reelect	.4928279	.2287795	2.15	0.031	.0444285	.9412274
lame	-.6409772	.1630813	-3.93	0.000	-.9606107	-.3213438
durhours	.073384	.010529	6.97	0.000	.0527476	.0940205
top	-.0012496	.0091183	-0.14	0.891	-.0191211	.0166219
outsidedc	.3268908	.0556148	5.88	0.000	.2178878	.4358937
fatal	**-.0010959**	**.0004419**	**-2.48**	**0.013**	**-.001962**	**-.0002297**
rgdpqr	**.0938677**	**.0229224**	**4.10**	**0.000**	**.0489405**	**.1387948**
_cons	-1.052709	.2346569	-4.49	0.000	-1.512628	-.5927898
/lnalpha	-3.298913	.9068746			-5.076355	-1.521472
alpha	.0369233	.0334848			.0062426	.2183903

Dependent Variable: Count of the president's "interviews," "news conferences," "spoken addresses and remarks," "oral addresses," and "miscellaneous remarks" per John Woolley and Gerhard Peters' *The American Presidency Project* (presidency.ucsb.edu) from January 20, 1977 through January 19, 1985.

[1] Analysis excludes weekends, federal holidays, and days with missing records.
[2] Standard Errors adjusted for clustering on month.

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This table extends the results from Table 2, Model 3 as per our discussion in footnote 14. Specifically, it shows the same model but with two additional variables: "war" (i.e., the number of combat fatalities during each quarter) and "prosperity" (i.e., the percent change in real gross domestic income during each quarter, seasonally adjusted).

Neither new variable is especially correlated with presidential public events (r = -.05 for military fatalities, r = .09 for economic growth), and adding them to the multiple regression model does not alter our coefficients, standard errors, or significance tests in any consequential way.

Here again, we did not have strong priors about how military engagements or economic growth would impact presidents' "speaking" activities across the 8 years studied here. So although the "war" and "prosperity" results achieve statistically significance with both are included in the multiple regression model, we are not as confident given the relatively high degree of economic volatility across a relatively short time span and the lack of corroborating evidence in more basic analyses.