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**Analyzing the Effects of Source Selection Method,
Acquisition Type, and Service Component
on Acquisition Outcomes**

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An AFICA-NPS Collaboration

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- “[S]elect the appropriate source selection process...to match the specific requirement, meet Warfighter needs, and deliver a contracted solution that will provide the required performance levels at the lowest cost” (Kendall, 2015).
- Consider requirement definition, complexity, performance risk (FAR 15.101)
- Seems simple enough, but it’s not always black & white



- Pre-Award
 - *Procurement Planning*
 - *Solicitation Planning*
 - Solicitation
- Award
 - *Source Selection*
- Post-Award
 - Contract Administration
 - Contract Close-Out/Termination



- LPTA
- Tradeoff (TO)
- Discussion of contract type & source selection method



- Scientifically test popular anecdotes regarding:
 - Procurement Administrative Lead Time
“LPTA acquisitions have a shorter PALT than Tradeoff acquisitions”
 - Performance Outcomes
“Tradeoff acquisitions produce higher CPARS scores than LPTA acquisitions”
- Examine differences in PALT & CPARS Scores:
 - Acquisition Type (Product v. Service)
 - Military Service Components (AF v. Navy)

- Data Collection

- 5 student teams, 7 contracting offices
- Scraped 147 files, resulted in 139 observations

LPTA	TO	Product	Service	AF	Navy
61	78	40	99	52	87

- Variables

- Independent Variables (IVs): LPTA / Tradeoff, Product / Service, AF / Navy (all binary)
- Dependent Variables (DV): PALT (days, continuous) & CPARS Scores (Likert 1-5)
- Covariates: \$ Value, # Reviews, # Evaluation Factors, # Offers

- Cell Design

Cell Design		
	Air Force	Navy
Product Acquisition	LPTA (6)	LPTA (18)
	TO (2)	TO (14)
Service Acquisition	LPTA (13)	LPTA (24)
	TO (31)	TO (31)



- Multivariate Analysis of Covariance (MANCOVA)
 - Group comparison method
 - Examines differences in groups (LPTA v. Tradeoff) on contract outcomes (PALT, CPARS Scores)
 - Are mean differences among the groups on a combination of DVs (after adjusting for covariate effects) likely to have occurred by chance?
 - Post-hoc analyses (ANCOVA)



- Outliers – Mahalanobis Distance
 - Dropped 8 observations
- Multivariate normality resulted in log transformation:
 - PALT, Value, # Reviews, # Offers
- Linearity
- Homogeneity of Regression
 - 3 violations, careful to remove offending variables
- Multicollinearity
- Homogeneity of Covariance Matrices
 - All grouping cells are homogenous



Assumption Testing

Covariates Available for MANCOVA/ANCOVAs			
Grouping Variable	MANCOVA: PALT & CPARS Scores	ANCOVA: PALT	ANCOVA: CPARS Scores
Source Selection Method	VALUE* NUMEVALFACT NUMOFFERS	VALUE NUMREVIEWS NUMEVALFACT NUMOFFERS	NUMEVALFACT NUMOFFERS
Acquisition Type	VALUE NUMEVALFACT	VALUE NUMREVIEWS NUMEVALFACT	VALUE NUMEVALFACT NUMOFFERS
Service Component	NUMEVALFACT*	VALUE NUMEVALFACT	NUMOFFERS
<p>*Although these variables are not fully linear with both DVs, their departure from linearity was minor. We tested the MANCOVAs with and without these variables, and the results were similar. We chose to include them in our analyses.</p>			



Results – Descriptive Statistics

Variable	Obs	Mean	StdDev	Min	Max	Grouping Variable
PALT (days)	133	303.02	271.71	3	1019	-
	60	143.38	110.02	3	482	LPTA SS
	73	434.22	294.52	21	1019	Tradeoff SS
	38	228.79	198.03	3	953	Product Acq
	95	332.71	291.75	8	1019	Service Acq
	51	329.10	294.40	21	1019	Air Force
	82	286.79	257.13	3	990	Navy
CPARS (average score)	69	4.00	.78	2.5	5	-
	20	3.63	.67	3	5	LPTA SS
	49	4.15	.79	2.5	5	Tradeoff SS
	14	3.50	.64	2.5	5	Product Acq
	55	4.13	.77	3	5	Service Acq
	35	4.07	.78	3	5	Air Force
	34	3.93	.80	2.5	5	Navy
Contract Dollar Value	139	\$39,700,000	\$85,800,000	\$27,819	\$450,000,000	-
	61	\$9,846,556	\$57,400,000	\$27,819	\$450,000,000	LPTA SS
	78	\$63,000,000	\$96,800,000	\$36,000	\$432,000,000	Tradeoff SS
	40	\$32,100,000	\$84,900,000	\$145,481	\$450,000,000	Product Acq
	99	\$42,700,000	\$86,300,000	\$27,819	\$432,000,000	Service Acq
	52	\$52,000,000	\$105,000,000	\$36,000	\$432,000,000	Air Force
	87	\$32,300,000	\$71,300,000	\$27,819	\$450,000,000	Navy
Number of Reviews	118	5.89	5.83	1	28	-
	56	5.77	5.46	1	25	LPTA SS
	62	6.00	6.19	1	28	Tradeoff SS
	35	4.11	4.12	1	22	Product Acq
	83	6.65	6.28	1	28	Service Acq
	44	6.52	6.05	1	28	Air Force
	74	5.53	5.69	1	25	Navy
Number of Evaluation Factors	129	2.67	.86	1	5	-
	55	2.13	.55	1	3	LPTA SS
	74	3.07	.83	2	5	Tradeoff SS
	35	2.40	.77	1	4	Product Acq
	94	2.77	.87	1	5	Service Acq
	48	2.42	.61	1	4	Air Force
	81	2.81	.95	1	5	Navy
Number of Offers	139	4.37	4.33	1	23	-
	61	3.85	4.39	1	23	LPTA SS
	78	4.78	4.27	1	22	Tradeoff SS
	40	4.22	3.39	1	12	Product Acq
	99	4.43	4.67	1	23	Service Acq
	52	6.40	5.70	2	23	Air Force
	87	3.16	2.63	1	12	Navy

Data presented is in its original form, before transformation.



- Grouping Variable: LPTA v. TO
 - Tradeoff source selections take 67% longer than LPTA source selections
 - CPARS Scores are 13% higher for TO source selections

But is this the whole story?



- **Grouping Variable: LPTA v. TO**
 - With covariates included, source selection method does not affect PALT...but covariates matter
 - Value, # Evaluation Factors, and # Offers increase PALT
 - With covariates included, source selection method does not affect CPARS Scores, nor do covariates



- **Grouping Variable: Products v. Services**
 - No difference in PALT between product & service acquisitions
 - Value & # Evaluation Factors increase PALT
 - CPARS Scores 15% higher for service acquisitions



- Grouping Variable: AF v. Navy
 - No difference in PALT between AF & Navy acquisitions
 - Value & # Evaluation Factors increase PALT
 - No difference in CPARS Scores between AF & Navy acquisitions



- Scientifically tested popular anecdotes
- The details of the acquisition matter!
 - Higher dollar value, more evaluation factors, more offers = longer PALT
 - Think about these variables when crafting acquisition strategies
- CPARS Scores higher for service acquisitions—are we properly evaluating performance of services?
- AF & Navy applying regulations & grading performance similarly



- More data are needed, however they are difficult to collect
- Look at EVMS data as an outcome variable



Federal Acquisition Regulation, 48 C.F.R. (2016).

Kendall, F. (2015). *Appropriate Use of Lowest Priced Technically Acceptable Source Selection Process and Associated Contract Type*. Retrieved from http://bbp.dau.mil/docs/Appropriate_Use_of_Lowest_Priced_Technically_Acceptable_Source_Select_Process_Assoc_Con_Type.pdf