

NATIONAL SCIENCE FOUNDATION
INDUSTRY/UNIVERSITY
COOPERATIVE RESEARCH CENTERS

FINAL

*1995-96 PROCESS OUTCOME
SURVEY RESULTS*

*DESCRIPTIVE STATISTICS
COMPILED FROM
INDUSTRY AND FACULTY SURVEYS*

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OVERVIEW**Data Set****CENTERS**

	Industry	Faculty
Population	45	46
Sample	37	36
Response Rate	82%	78%

INDIVIDUALS

	Industry	Faculty
Population	699	817
Sample	307	243
Response Rate	44%	30%

Report Processing

This report provides basic descriptive statistics on the evaluator process/outcome questionnaire. Data was typically collected during fall of 1996, referencing the past year, and therefore reflects activity for 1995-96.

Since most evaluators use this report to benchmark their center compared to a program-wide "norm", we have reported "center-level" means and standard deviations. Center-level means are an *unweighted* mean of means: means for each center were used to calculate a center-level mean.¹ Center-level means and standard deviations can be used to determine a center's performance relative to other centers. Because questions which required a numeric answer (e.g., number of dollars) often demonstrated a highly skewed distribution, we also report medians for these variables. For forced choice questions, frequencies and standard deviations based on individual respondents are also reported.²

One question on the industry survey (#6: the number of new projects supported by industry and the dollar value of these research projects) warranted the reporting in two ways: 1) based on all respondents, and 2) based only on respondents who reported at least one project.

Data Coding Problems

Please note the following data coding problems:

1. Numeric questions which ask for subtotals

Missing data problems occur with industry question #6 (number of projects and dollars) and faculty question #3a,b (number of publications broken down by "with students", "with industry scientists"). Both items ask respondents to answer questions which are obviously linked (e.g., number of projects and dollars spent on those projects). In many cases, when the respondent answers "0" for the first question, they leave the second question "blank". Since "blanks" are coded as missing data, means for this variable were inflated (i.e., answers which should be "zero" are being reported as missing). We have addressed this problem by recoding the second question as "0" when the first question is responded to as "0." We encourage evaluators to screen their data and correct this problem in their local report.

2. Dollars for center-related projects

Industry question #6 (dollars spent on "follow-on" projects) asks respondents to provide a dollar value for center-related research projects. We have noticed some very large numbers for this question and thus we encourage evaluators to validate responses in excess of \$1,000,000.

¹ Unweighted means did not differ substantially (typically one-tenth of a point on 5-point forced-choice questions) from means calculated on individual-level data.

² Missing data is excluded in all percentages. However, in Tables 3 & 4, percentages for the N/A responses are included.

INDUSTRY RESULTS: 1995-96

TABLE 1: INTEREST IN RESEARCH

1) What percentage of Center research projects do you take an active interest in?

INDIVIDUAL FREQUENCIES										CENTER LEVEL	
0-19% (1)		20-39% (2)		40-59% (3)		60-79%(4)		80-100%(5)		MEAN	S.D.
N	%	N	%	N	%	N	%	N	%		
51	17.1	84	28.2	65	21.8	68	22.8	30	10.1	2.74	.65

3) How long, on average, do you feel that it should take for a new Center research project to yield tangible results?
number of months:

CENTER LEVEL	
MEAN	S.D.
17.69	4.77

TABLE 2: SATISFACTION WITH RESEARCH PROGRAM

4) During the past year, how satisfied were you with the following features of the Center's research program?

	INDIVIDUAL FREQUENCIES										CENTER LEVEL	
	Not Satisfied 1		Slightly Satisfied 2		Somewhat Satisfied 3		Quite Satisfied 4		Very Satisfied 5		MEAN	S. D.
	N	%	N	%	N	%	N	%	N	%		
a Capabilities of faculty and graduate students	1	.3	4	1.3	27	8.8	187	61.1	87	28.4	4.14	.29
b Breadth of the research topic covered	2	.7	5	1.6	85	27.9	163	53.4	50	16.4	3.80	.33
c Focus of the research	3	1.0	14	4.6	92	30.3	158	52.0	37	12.2	3.69	.33
d Technical quality of the research	0	0	4	1.3	52	17.0	170	55.6	80	26.1	4.06	.28
e Innovative quality of the research	2	.7	15	5.0	79	26.1	161	53.1	46	15.2	3.77	.33
f Relevance of research to my organization's short term (1-2 years) needs	9	3.0	38	12.5	131	43.2	103	34.0	22	7.3	3.34	.35
g Relevance of research to my organization's long term (3+ years) needs	3	1.0	15	4.9	75	24.8	157	51.5	55	18.0	3.85	.34

TABLE 3: FOLLOW-ON RESEARCH

6) During the past year, approximately how many center-stimulated research projects were supported by your organization (include projects contracted to outside performers)? Please estimate the dollar value of all center-stimulated research projects.

	CENTER LEVEL					
	# of projects/ member			Total dollar value of/ member		
	MEAN	MEDIAN	S. D.	MEAN	MEDIAN	S. D.
a New research projects supported by your organization Total Sample (N of members = 264, N of Centers = 37)	1.45	1.29	.93	219,693	87,143	469,899
b New research projects supported by your organization At Least One Project (N of members = 167, N of Centers = 23)	1.94	1.67	.85	326,345	147,000	572,929
c Average project cost At Least One Project (N of members = 167, N of Centers = 23)				248,468	76,719	579,758

TABLE 4: TECHNICAL BENEFITS

7) During the past year, to what extent has participation in the Center contributed to the following technical benefits for your organization?

	INDIVIDUAL FREQUENCIES										CENTER LEVEL			
	No Impact 1		Slight Impact 2		Moderate Impact 3		High Impact 4		Very High Impact 5		Not Applicable N/A		MEANS	S. D.
	N	%	N	%	N	%	N	%	N	%	N	%		
Research and Development														
a	10	3.3	25	8.3	108	36.0	124	41.3	33	11.0	5	1.6	3.48	.42
b	38	12.9	61	20.7	119	40.5	59	20.1	17	5.8	11	3.6	2.87	.45
c	45	15.5	70	24.1	103	35.5	53	18.3	19	6.6	14	4.6	2.78	.53
d	59	20.6	72	25.1	86	30.0	55	19.2	15	5.2	17	5.5	2.57	.63
Commercialization														
e	68	24.2	76	27.0	91	32.4	43	15.3	3	1.1	24	7.8	2.33	.59
f	74	26.2	75	26.6	87	30.9	38	13.5	8	2.8	22	7.2	2.38	.53
g	125	50.4	66	26.6	44	17.7	12	4.8	1	.4	56	18.2	1.74	.45
h	124	48.8	74	29.1	38	15.0	16	6.3	2	.8	50	16.3	1.76	.44

TABLE 5: OTHER BENEFITS

10) During the past year, to what extent has participation in the center contributed to the following other benefits for your organization?

	INDIVIDUAL FREQUENCIES										CENTER LEVEL			
	No Impact 1		Slight Impact 2		Moderate Impact 3		High Impact 4		Very High Impact 5		Not Applicable N/A		MEANS	S. D.
	N	%	N	%	N	%	N	%	N	%	N	%		
a	88	33.6	58	22.1	59	22.5	42	16.0	15	5.7	42	13.7	2.27	.69
b	20	6.8	42	14.4	110	37.7	91	31.2	29	9.9	12	3.9	3.19	.45
c	34	11.7	55	18.9	104	35.7	76	26.1	22	7.6	14	4.6	2.95	.48
11) During the past year, how many students trained in the Center research projects were hired by your organization?												students hired:	.33	.31

TABLE 6: CENTER ADMINISTRATION & OPERATIONS

12) During the past year, how satisfied were you with the following features of the Center's administrative operations?

	INDIVIDUAL FREQUENCIES										CENTER LEVEL	
	Not Satisfied 1		Slightly Satisfied 2		Somewhat Satisfied 3		Quite Satisfied 4		Very Satisfied 5		MEAN	S. D.
	N	%	N	%	N	%	N	%	N	%		
a Communication between Center staff and your organization	4	1.3	12	4.0	61	20.1	154	50.8	72	23.8	3.91	.38
b Center-related proposals, reports, and publications (e.g. quality and timeliness)	4	1.3	13	4.3	72	23.9	156	51.8	56	18.6	3.75	.42
c Planning and development of the research program (e.g. new projects, changes in research areas)	7	2.3	27	9.0	104	34.8	128	42.8	33	11.0	3.46	.44
d Management of ongoing research projects	4	1.3	9	3.0	98	32.6	161	53.5	29	9.6	3.67	.36
e Project selection process	7	2.3	25	8.4	95	31.9	125	41.9	46	15.4	3.57	.43
f Technology transfer activities	7	2.5	33	11.8	109	38.9	103	36.8	28	10.0	3.34	.43
g Center fundraising (e.g. member recruitment, grant-writing)	8	2.8	36	12.8	101	35.9	118	42.0	18	6.4	3.33	.47
h Management of intellectual property issues	9	3.3	23	8.5	83	30.6	129	47.6	27	10.0	3.43	.60

TABLE 7: GENERAL EVALUATION

14) To what extent are you generally satisfied with the operation and activities of the Center?	INDIVIDUAL FREQUENCIES										CENTER LEVEL	
	Not Satisfied 1		Slightly Satisfied 2		Somewhat Satisfied 3		Quite Satisfied 4		Very Satisfied 5		MEAN	S. D.
	N	%	N	%	N	%	N	%	N	%		
	2	.7	9	3.0	74	24.3	167	54.8	53	17.4	3.83	.34

15) Will your organization renew its membership?	INDIVIDUAL FREQUENCIES										CENTER LEVEL	
	Definitely Not 1		Probably Not 2		Uncertain 3		Probably Yes 4		Definitely Yes 5		MEAN	S. D.
	N	%	N	%	N	%	N	%	N	%		
	3	1.0	8	2.7	48	16.0	152	50.7	89	29.7	4.05	.31

TABLE 8: MEMBERSHIP INFORMATION

18) Which one of the following industrial categories best describes your division's primary research area?

INDIVIDUAL FREQUENCIES								
	N	%		N	%		N	%
Food	1	.3	Primary metals	44	14.9	Electrical, electronic, or communication equipment	51	17.2
Textiles or apparel	0	0	Fabricated metals	10	3.4	Professional or scientific instruments	10	3.4
Lumber, wood, or furniture	1	.3	Machinery	8	2.7	Surgical or medical supplies	7	2.4
Paper	1	.3	Motor vehicles	23	7.8	Other manufacturing	14	4.7
Chemical	48	16.2	Other transportation	5	1.7	Health services	10	3.4
Petroleum	8	2.7	Aircraft or missiles	8	2.7	Mining	2	.7
Rubber	0	0	Munitions	9	3.0	Building or construction	2	.7
Stone, clay, or glass	12	4.1	Other military equipment	7	2.4	Other non-manufacturing	15	5.1

TABLE 9: MEMBERSHIP INFORMATION

19) Years organization has been a member of the Center:

	INDIVIDUAL FREQUENCIES	
	N	%
1) 0-1 years	28	10.6
2) 2-3 years	70	26.4
3) 4-5 years	55	20.8
4) 6-7 years	45	17.0
5) 8 or more years	67	25.3

20) Organization is:

	INDIVIDUAL FREQUENCIES	
	N	%
1) For-Profit	228	86.0
2) Non-Profit / Government	37	14.0

FACULTY RESULTS: 1995-96

TABLE 10: RESEARCH PROGRAM

1) Compared to the research projects which you typically conduct outside the Center, would you describe your Center-funded research as:

INDIVIDUAL FREQUENCIES											CENTER LEVEL	
Much more basic 1		More basic 2		Same 3		More applied 4		Much more applied 5				
N	%	N	%	N	%	N	%	N	%	MEAN	S. D.	
a)	3	1.3	25	10.9	102	44.5	85	37.1	14	6.1	3.32	.53
INDIVIDUAL FREQUENCIES											CENTER LEVEL	
Much broader in scope 1		Broader 2		Same 3		Narrower 4		Much narrower in scope 5				
N	%	N	%	N	%	N	%	N	%	MEAN	S. D.	
b)	11	5.1	39	18.1	96	44.7	61	28.4	8	3.7	2.98	.52
INDIVIDUAL FREQUENCIES											CENTER LEVEL	
Much longer time frame 1		Longer 2		Same 3		Shorter 4		Much shorter time frame 5				
N	%	N	%	N	%	N	%	N	%	MEAN	S. D.	
c)	5	2.2	33	14.5	99	43.4	74	32.5	17	7.5	3.26	.61

TABLE 11: KNOWLEDGE PRODUCTION

	<u>CENTER LEVEL</u>		<u>CENTER LEVEL</u>		<u>CENTER LEVEL</u>	
	<u>MEANS</u>	<u>S. D.</u>	<u>MEANS</u>	<u>S. D.</u>	<u>MEANS</u>	<u>S. D.</u>
3) During the past year:						
a) How many publications in the open literature have you had based on Center research?	2.64	2.09	1.42	1.69	2.25	2.06
b) How many presentations have you made at conferences or professional meetings based on Center research?	2.93	1.91	1.51	1.63	2.27	1.48
	Number completed during last year		Number still in progress			
	<u>MEAN</u>	<u>S. D.</u>	<u>MEAN</u>	<u>S. D.</u>		
c) How many theses/dissertations based on Center research are under your supervision?	1.11	1.06	2.02	1.89		
2) How long, on average, do you feel that it should take for a new Center research project to yield tangible results?					<u>CENTER LEVEL</u>	
					<u>MEAN</u>	<u>S. D.</u>
number of months:					18.87	6.52

TABLE 12: INVESTIGATOR OUTCOMES

4) What impact has participation in the Center had for YOU in the following areas?	INDIVIDUAL FREQUENCIES										CENTER LEVEL	
	Very negative impact 1		Moderately negative impact 2		No impact 3		Moderately positive impact 4		Very positive impact 5		MEANS	S. D.
	N	%	N	%	N	%	N	%	N	%		
a Opportunities for consulting	0	0	4	1.7	128	53.3	85	35.4	23	9.6	3.54	.40
b Opportunities for research contracts	0	0	6	2.5	54	22.4	128	53.1	53	22.0	3.98	.41
c Access to equipment	0	0	2	.8	100	41.5	83	34.4	56	23.2	3.85	.46
d Trust & confidence in Industry	0	0	8	3.3	70	28.9	105	43.4	59	24.4	3.95	.41
e My evaluation of the quality of industrial research	3	1.3	13	5.5	98	41.2	93	39.1	31	13.0	3.60	.37
f Chances for promotion, tenure, and/or salary increases	5	2.1	7	3.0	126	53.4	77	32.6	21	8.9	3.37	.35
g Amount of interaction with other faculty	0	0	2	.8	44	18.2	135	55.8	61	25.2	4.04	.45
h Ability to support graduate student thesis/dissertation research	1	.4	1	.4	49	20.2	102	42.1	89	36.8	4.20	.45
i Amount of autonomy in conducting research	1	.4	38	15.7	97	40.1	67	27.7	39	16.1	3.49	.55
j Ability to publish research in a timely fashion	4	1.7	24	10.0	124	51.5	58	24.1	31	12.9	3.39	.62

TABLE 13: PERCEIVED INDUSTRY BENEFITS

5) During the past year, how much of an impact do you believe YOUR RESEARCH had on the following technical benefits for Center members?

	INDIVIDUAL FREQUENCIES												CENTER LEVEL	
	No Impact 1		Slight Impact 2		Moderate Impact 3		High Impact 4		Very High Impact 5		Not Applicable N/A		MEANS	S. D.
	N	%	N	%	N	%	N	%	N	%	N	%		
a Research and development efforts	19	8.3	39	17.0	77	33.6	68	29.7	26	11.4	11	4.5	3.28	.71
b Commercialization of products, processes, and/or services	62	28.7	51	23.6	55	25.5	34	15.7	14	6.5	24	9.9	2.59	.74

TABLE 14: SATISFACTION

7) During the past year, how satisfied were you with the following features of the Center?

	INDIVIDUAL FREQUENCIES										CENTER LEVEL	
	Not Satisfied 1		Slightly Satisfied 2		Somewhat Satisfied 3		Quite Satisfied 4		Very Satisfied 5		MEANS	S. D.
	N	%	N	%	N	%	N	%	N	%		
a Quality of the research program	2	.9	13	5.6	47	20.1	116	49.6	56	23.9	3.89	.50
b Relevance of the research program to industry's needs	3	1.3	9	3.9	37	15.9	109	46.8	75	32.2	4.05	.59
c Center administration and operations	15	6.5	20	8.7	34	14.7	89	38.5	73	31.6	3.69	.89

TABLE 15: BACKGROUND

9) What is your academic rank?	INDIVIDUAL FREQUENCIES	
	N	%
1) Assistant Professor	50	21.0
2) Associate Professor	52	21.8
3) Full Professor	105	44.1
4) Other	31	13.0

10a) Are you tenured?	INDIVIDUAL FREQUENCIES	
	N	%
1) Yes	145	62.2
2) No	88	37.8

10b) If NO, are you in a tenure track position?	INDIVIDUAL FREQUENCIES	
	N	%
1) Yes	45	51.7
2) No	42	48.3