

NATIONAL SCIENCE FOUNDATION
INDUSTRY/UNIVERSITY
COOPERATIVE RESEARCH CENTERS

FINAL

*1996-97 PROCESS OUTCOME
SURVEY RESULTS*

*DESCRIPTIVE STATISTICS
COMPILED FROM
INDUSTRY AND FACULTY SURVEYS*

JUNE 1998

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OVERVIEW

Data Set

CENTERS

	Industry	Faculty
Population	50	50
Sample	41	38
Response Rate	82%	76%

INDIVIDUALS

	Industry	Faculty
Population	646	607
Sample	311	256
Response Rate	48%	42%

Report Processing

This report provides basic descriptive statistics on the evaluator process/outcome questionnaire. Data was typically collected during fall of 1997, referencing the past year, and therefore reflects activity for 1996-97.

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 being reported in two ways: 1) based on all respondents, and 2) based only on respondents who reported at least one project.

Data Coding Issues

Please note the following data coding issue:

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". 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.

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 The sum of group percentages may exceed 100% due to rounding error. Missing data is excluded in all percentages, however, in Table 3 & 4, percentages for the N/A responses are included.

INDUSTRY RESULTS: 1996-97

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	%		
39	12.8	73	23.9	89	29.2	78	25.6	26	8.5	2.79	.72

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.
17.65	4.32

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	0	0	4	1.3	28	9.1	180	58.3	97	31.4	4.20	.29
b Breadth of the research topic covered	1	.3	12	3.9	79	25.8	168	54.9	46	15.0	3.75	.34
c Focus of the research	3	1.0	18	5.8	102	33.1	148	48.1	37	12.0	3.60	.43
d Technical quality of the research	0	0	6	1.9	60	19.4	167	54.0	76	24.6	4.00	.40
e Innovative quality of the research	2	.7	10	3.3	79	25.7	160	52.1	56	18.2	3.82	.41
f Relevance of research to my organization's short term (1-2 years) needs	8	2.6	53	17.2	115	37.3	101	32.8	31	10.1	3.26	.50
g Relevance of research to my organization's long term (3+ years) needs	6	1.9	20	6.5	77	25.0	159	51.6	46	14.9	3.65	.45

Mean of means

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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 = 257 , N of Centers = 41)	1.35	1.25	.70	118,227	80,000	147,172
b New research projects supported by your organization At Least One Project (N of members =164 , N of Centers = 23)	1.81	1.67	.55	153,369	95,542	198,810
c Average project cost At Least One Project (N of members =164 , N of Centers = 23)				96,776	51,625	161,089

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?

Research and Development	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 Increased our general technical awareness and/or capabilities	7	2.2	32	10.3	112	35.9	109	34.9	49	15.7	3	1.0	3.56	.60
b Accelerated or improved existing research projects	36	11.5	61	19.6	117	37.5	66	21.2	19	6.1	13	4.2	2.92	.56
c Stimulated new research projects	52	16.8	81	26.1	86	27.7	57	18.4	21	6.8	13	4.2	2.71	.56
d Contributed to development of intellectual property within my organization	69	22.3	65	21.0	79	25.5	57	18.4	19	6.1	21	6.8	2.60	.63
Commercialization														
e Improvements to existing products, processes or services	66	21.3	82	26.5	83	26.8	43	13.9	14	4.5	22	7.1	2.39	.54
f Development of new products, processes, or services	69	22.3	73	23.6	85	27.5	45	14.6	15	4.9	22	7.1	2.45	.65
g Improved sales and/or profitability	117	37.9	65	21.0	44	14.2	25	8.1	4	1.3	54	17.5	1.85	.55
h Created or helped maintain jobs in your organization	125	40.6	70	22.7	43	14.0	14	4.5	5	1.6	51	16.6	1.79	.52

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 Enhanced your ability to recruit talented students	107	34.5	44	14.2	66	21.3	36	11.6	17	5.5	40	12.9	2.36	.86
b Improved cooperation with scientists and technical resources outside your organization	17	5.4	53	17.0	114	36.5	92	29.5	30	9.6	6	1.9	3.21	.50
c Improved cooperation with other Center members	32	10.3	54	17.4	110	35.4	82	26.4	23	7.4	10	3.2	3.06	.50
11) During the past year, how many students trained in the Center research projects were hired by your organization?												students hired:	.30	.34

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	8	2.6	20	6.5	70	22.7	145	46.9	66	21.4	3.77	.45
b Center-related proposals, reports, and publications (e.g. quality and timeliness)	8	2.6	17	5.5	82	26.5	150	48.4	53	17.1	3.69	.50
c Planning and development of the research program (e.g. new projects, changes in research areas)	7	2.3	25	8.1	95	30.9	137	44.6	43	14.0	3.59	.52
d Management of ongoing research projects	4	1.3	16	5.2	79	25.5	174	56.1	37	11.9	3.67	.43
e Project selection process	8	2.6	24	7.8	78	25.3	148	48.1	50	16.2	3.64	.46
f Technology transfer activities	11	3.8	35	12.0	119	40.9	94	32.3	30	10.3	3.32	.48
g Center fundraising (e.g. member recruitment, grant-writing)	15	5.2	25	8.7	102	35.3	100	34.6	46	15.9	3.41	.67
h Management of intellectual property issues	11	3.8	23	8.0	91	31.6	124	43.1	37	12.8	3.56	.46

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	%		
	7	2.3	13	4.2	60	19.5	179	58.3	48	15.6	3.74	.60

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	%		
	7	2.3	7	2.3	41	13.4	155	50.5	97	31.6	3.99	.47

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	9	2.9	Primary metals	8	2.6	Electrical, electronic, or communication equipment	51	16.7
Textiles or apparel	2	.7	Fabricated metals	2	.7	Professional or scientific instruments	8	2.6
Lumber, wood, or furniture	3	1.0	Machinery	10	3.3	Surgical or medical supplies	10	3.3
Paper	1	.3	Motor vehicles	14	4.6	Other manufacturing	19	6.2
Chemical	40	13.1	Other transportation	6	2.0	Health services	26	8.5
Petroleum	19	6.2	Aircraft or missiles	8	2.6	Mining	4	1.3
Rubber	2	.7	Munitions	7	2.3	Building or construction	7	2.3
Stone, clay, or glass	14	4.6	Other military equipment	16	5.2	Other non-manufacturing	20	6.5

TABLE 9: MEMBERSHIP INFORMATION

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

	INDIVIDUAL FREQUENCIES	
	N	%
1) 0-1 years	45	15.5
2) 2-3 years	86	29.7
3) 4-5 years	51	17.6
4) 6-7 years	39	13.4
5) 8 or more years	69	23.8

20) Organization is:

INDIVIDUAL FREQUENCIES

	N	%
1) For-Profit	240	81.4
2) Non-Profit / Government	55	18.6

21) Which functional group pays for your organization's membership in this Center?: [multiple responses allowed; N reflects responses not respondents]

INDIVIDUAL FREQUENCIES

	N	%
1) Corporate	52	19.1
2) Research	101	37.1
3) Development	30	11.0
4) Engineering	30	11.0
5) Product Development	29	10.7
6) Manufacturing	6	2.2
7) Marketing/Sales	12	4.4
8) Other	12	4.4

22) Which of the following best describes your estimate of your division/organization's financial status for next fiscal year?:

INDIVIDUAL FREQUENCIES

	N	%
1) Significant budget cuts	16	8.3
2) Modest budget cuts	38	19.7
3) Stable budget	92	47.7
4) Modest budget increases	43	22.3
5) Significant budget increases	4	2.1

FACULTY RESULTS: 1996-97

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)	2	.8	23	9.2	112	45.0	97	39.0	15	6.0	3.40	.33
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)	13	5.3	53	21.5	112	45.3	62	25.1	7	2.8	2.94	.42
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)	13	5.3	30	12.2	97	39.4	92	37.4	14	5.7	3.25	.50

TABLE 11: KNOWLEDGE PRODUCTION

3) During the past year:	<u>CENTER LEVEL</u>		<u>CENTER LEVEL</u>		<u>CENTER LEVEL</u>	
	Total number MEANS	S. D.	Number with member scientists MEANS	S. D.	Number with students MEANS	S. D.
a) How many publications in the open literature have you had based on Center research?	3.79	6.91	1.98	3.35	3.71	6.74
b) How many presentations have you made at conferences or professional meetings based on Center research?	3.76	3.77	2.06	2.32	2.68	1.77
c) How many theses/dissertations based on Center research are under your supervision?	Number completed during last year MEAN S. D.		Number still in progress MEAN S. D.			
	1.21	1.68	2.13	2.06		

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>	
	number of months:	MEAN S. D.
	17.27	5.11

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	1	.4	149	59.6	74	29.6	25	10.0	3.55	.44
b Opportunities for research contracts	0	0	1	.4	57	22.9	127	51.0	64	25.7	4.05	.37
c Access to equipment	1	.4	1	.4	98	39.0	98	39.0	53	21.1	3.85	.44
d Trust & confidence in industry	0	0	6	2.4	64	25.8	115	46.4	63	25.4	3.94	.34
e My evaluation of the quality of industrial research	2	.8	7	2.8	95	38.5	96	38.9	47	19.0	3.72	.36
f Chances for promotion, tenure, and/or salary increases	3	1.2	8	3.2	129	51.8	74	29.7	35	14.1	3.52	.43
g Amount of interaction with other faculty	0	0	4	1.6	34	13.6	136	54.4	76	30.4	4.09	.30
h Ability to support graduate student thesis/dissertation research	0	0	2	.8	37	15.2	103	42.2	102	41.8	4.26	.44
i Amount of autonomy in conducting research	3	1.2	23	9.2	101	40.6	80	32.1	42	16.9	3.53	.41
j Ability to publish research in a timely fashion	6	2.4	18	7.2	126	50.4	60	24.0	40	16.0	3.47	.45

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	14	5.6	45	18.0	78	31.2	66	26.4	32	12.8	15	6.0	3.32	.63
b Commercialization of products, processes, and/or services	72	28.8	35	14.0	62	24.8	41	16.4	12	4.8	28	11.2	2.59	.75

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	4	1.6	12	4.8	51	20.4	109	43.6	74	29.6	3.94	.48
b Relevance of the research program to industry's needs	0	0	9	3.6	37	14.9	120	48.2	83	33.3	4.16	.43
c Center administration and operations	11	4.4	14	5.6	40	16.0	82	32.8	103	41.2	4.03	.59

TABLE 15: BACKGROUND

9) What is your academic rank?	INDIVIDUAL FREQUENCIES	
	N	%
1) Assistant Professor	40	16.0
2) Associate Professor	52	20.8
3) Full Professor	123	49.2
4) Other	35	14.0

10a) Are you tenured?	INDIVIDUAL FREQUENCIES	
	N	%
1) Yes	170	68.8
2) No	77	31.2

10b) If NO, are you in a tenure track position?	INDIVIDUAL FREQUENCIES	
	N	%
1) Yes	34	46.6
2) No	39	53.4