APPENDICES

APPENDIX A

Questionnaire

University of the Western Cape

Department of Computer Science

Questionnaire for Teamwork and Cooperative Learning Project

Dear Student,

Thank you for completing this questionnaire. It will be used as input to a **research project on teamwork and cooperative learning**. Your responses will be treated with the utmost of confidence.

Please use the answer sheet to answer the following questions. (PLEASE do not forget to fill in your **student number**! The data will be statistically analysed and without the student number it becomes worthless.)

Use the table below when giving your response to the questions.

Always/ Definitely/ Strongly Agree	A
Frequently/ Nearly always/ Agree	B
Occasionally/ Seldom/ Probably	C
Never/ Disagree	D
Strongly Disagree	E

A. Behaviour in Own Group.

1. I offer facts and relevant information in order to promote group discussion.
2. I give my opinions and ideas and provide suggestions in order to promote group discussion.
3. I express my willingness to cooperate with my group members.
4. I expect my group members to be cooperative.
5. I give support to group members who are struggling to express themselves intellectually.
6. I keep my thoughts, feelings and reactions to myself during group discussions.
7. I evaluate the contributions of group members in terms of whether their contributions are useful to me.
8. I take risks in expressing new ideas and my current feelings during group discussions.
9. I communicate to other group members that I am aware of and appreciate their abilities, talents, skills and resources.
10. I share any sources of information or other sources I have with my group members in order to promote the success of the individual members as well as the group as a whole.
11. I paraphrase or summarize what other members have said before I respond or comment.
12. I offer help to anyone in the group in order to bring up the performance of everyone.

B Acceptance of the Student as Group Member.

13. My fellow group members are completely honest with me.
14. My fellow group members understand what I am trying to communicate.
15. My fellow group members interrupt my comments.
16. My fellow group members accept me just the way I am.
17. My fellow group members tell me when I bother them.
18. My fellow group members make it easy for me to be myself.
19. My fellow group members include me in what they are doing.
20. My fellow group members value me as a person, apart from my skills or status.

C. Group Cohesion

21. I try to make sure that everyone enjoys being a member of the group.
22. I discuss my ideas, feelings and reactions to what is currently taking place within the group.
23. I express acceptance and support when other members disclose their ideas, feelings and reactions to what is currently taking place in the group.
24. I try to make all members feel valued and appreciated.
25. I try to include all members in group activities.
26. I'm influenced by group members.
27. I take risks in expressing new ideas and my current feelings.
28. I express liking, affection, concern for other members.
29. I encourage group norms that support individuality and personal expression.

D. Group Work in General

30. I have learnt more in the group than I would have learnt on my own.
31. I enjoyed working in a group.
32. The group motivated me to do my share of the work.
33. The group work helped me understand the study material better.
34. I learnt to cooperate with other students.
35. The group work caused me to be dependable and do my assignments.
36. It was fun working in a group.
37. In the group I got the benefit of everyone's ideas.
38. When I had problems, I got help from group members.
39. The work got done faster and more work was done.
40. The group work gave me an opportunity to talk and discuss the study material.
41. The group work made the study material more interesting.

E. Mind Maps

42. I enjoy doing the mind maps.
43. Mind maps have increased my understanding of the subject.
44. Mind maps give me a broader perspective of the work.
45. Doing mind maps with my team helps me to include all relevant information.
46. It is easier to remember the important facts once the mind map has been drawn.
47. Through mind mapping I have learnt a new way of ordering facts and information.
48. Mind maps do not help me when studying the relevant sections.
49. I cannot see the value of creating a mind map.
50. When writing a test the mind map is useless.
51. It is interesting to see how other groups do their mind mapping.
52. It is important that the mind maps are presented. It enhances my understanding.

F. Belbin's Team Roles

* Questions 56 and 57 only to be answered by Computer Science students.

53. I have gained insight into the role I can play within a team.
54. My team profile is a good reflection of me.
55. It was interesting to see how other people rated me.
56. *The teams that were constituted using the team profiles function better than those that were chosen alphabetically.
57. *Teams function better this semester because of the experience gained in the first semester.
58. I know the students in this class, on a more personal note, better than I do the students in other classes that I have attended.
59. I have learnt to work in a team.
60. I have gained insight into my strengths and weaknesses within a team.

G. Background Information

61. Gender

Female	A
Male	B

62. Age

< 21	A
21 - < 24	B
24 - < 27	C
27 +	D

63. Schooling

Public School in the RSA	A
Private School in the RSA	B
Private School in another country	C
Public School in another country	D

64. **Year Matric was written

Before 1992	A
1992	B
1993	C
1994	D
1995	E

*(** Different from previous questionnaires)*

65. Matric Average Symbol

A
B
C
D
E

66. Maths Matric Symbol

A
B
C
D
E

67. Degree

B.Sc.	A
B.Com.	B

68. Do you have any other tertiary qualifications?

Yes	A
No	B

69. My home language is:

Xhosa	A
English	B
Afrikaans	C
Zulu	D
Other	E

If OTHER, PLEASE fill in your home language in the space provided for your name on the pink answer sheet.

70. When did you first register as a student?

Before 1994	A
1994	B
1995	C
1996	D
1997	E

71. Have you changed your course since your first registration?

Yes	A
No	B

I General

Use the table on the first page to respond to these questions.

72. I was prejudiced towards people of other cultures before getting to know them in my group.
73. Working in a group improved my self-esteem.
74. I prefer formal lectures to the more informal way the class was conducted.
75. I have enjoyed doing the computer science project / statistics weekly assignments.
76. The computer practical enhanced my understanding of the work.
77. The computer practical was difficult.
78. I find it difficult to express myself in English.
79. Little help was available whilst doing the computer practical.
80. I use my own computer at home.
81. I use e-mail.
82. I access the Internet regularly.
83. I enjoyed the course.
84. I liked the way the class was conducted (lectures combined with group work.)
85. How often do you attend lectures?
86. Did you find it difficult to understand certain concepts as a result of the language or terminology used in lectures?
87. I read through the relevant sections before attending class.
88. I prefer this method of teaching more than the conventional lectures.
89. Was the lecturer's attitude positive whenever you approached her for help?
90. Was the textbook easy to read?

91. Do you feel that you were always well informed as to what was expected from you, for example: information on tests, tutorials, calculation of evaluation mark, etc.?

92. Was there enough opportunity to discuss problems with the lecturer?

93. I never prepare before attending class.

* The following questions only to be answered by Computer Science students.

94. I prefer courses to be blocked (thus that only the course CS324 was given in all the lecture periods of the second term.)

95. To report on our progress each week helped our group to manage our time more efficiently.

Please tear off and hand in.

ANY OTHER USEFUL COMMENTS?

Thank you for your cooperation.

Regards

Isabel Venter and Rénette Blignaut

APPENDIX B

Questions to guide "unstructured" interviews on group work and cooperative learning

- Do you enjoy working in a group?
- What do you think of the Belbin roles?
- Have you changed your way of learning?
- Did working in the group change your perceptions of people from other cultural groups?
- Did the mind map help you to understand the work?
- Your comments on the practical / project.
- Any other comment?

APPENDIX C

Donald A. Schön's reflective conversation protocol

In this study the preferred method for collecting interview data was the unstructured or semi-structured interview (using the reflective conversation protocol as described by Schön). Reflection-in-action is typically used to explore professional practice. It was felt that the teaching of professionals in the computing field could benefit from such a reflection-in-action-perspective. The interviews were unstructured and conversation-like so that it was possible to probe directions and topics which the researchers did not set out to discuss or evaluate. As in a conversation, the discussion would progress naturally – resulting in the emergence of themes which otherwise could have been overlooked. It allows the researcher to reflect on his/her praxis but also the learner to reflect on his/her learning. The researcher can unintentionally impose unconscious assumptions on the interviewee with his/her choice of questions (sometimes called the "Hawthorne Effect"). By using the conversation protocol this effect could be avoided.

In his book, "The Reflective Practitioner. How Professionals Think in Action", Schön [1983] explores the reflective conversation using two very different professional practices: architecture and psychotherapy. By comparing the reflection-in-action of these professions he describes "*the general form of the process and some of the main criteria of rigor appropriate to it*" [Schön, 1983: 74].

> *In the reflective conversation, the practitioner's effort to solve the reframed problem yields new discoveries which call for new reflection-in-action* [Schön, 1983: 132].

APPENDIX D

QUANTITATIVE ANALYSES OF 1997/1998 DATA SET

Frequencies of 1997 and 1998 data

(No duplicate students in the group.)

Gender

QG1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Female	92	47.7	92	47.7
Male	101	52.3	193	100.0

Frequency Missing = 10

Age

QG2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
<21	57	29.4	57	29.4
21-23	100	51.5	157	80.9
24-27	23	11.9	180	92.8
27+	14	7.2	194	100.0

Frequency Missing = 9

Language

QG9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Xhosa	49	25.5	49	25.5
English	62	32.3	111	57.8
Afrikaans	37	19.3	148	77.1
Zulu	9	4.7	157	81.8
Other	35	18.2	192	100.0

Frequency Missing = 11

GROUP	Frequency	Percent	Cumulative Frequency	Cumulative Percent
c97	55	27.1	55	27.1
c98	43	21.2	98	48.3
s97	39	19.2	137	67.5
s98	66	32.5	203	100.0

Appendix D

GRP	Frequency	Percent	Cumulative Frequency	Cumulative Percent
C	98	48.3	98	48.3
S	105	51.7	203	100.0

Preferred grp method above conv lectures

QI17	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	107	56.3	107	56.3
Probably	51	26.8	158	83.2
Disagree	32	16.8	190	100.0

Frequency Missing = 13

Access Internet regularly

QI11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	80	42.3	80	42.3
Probably	53	28.0	133	70.4
Disagree	56	29.6	189	100.0

Frequency Missing = 14

Used my own computer at home

QI9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	45	23.9	45	23.9
Probably	18	9.6	63	33.5
Disagree	125	66.5	188	100.0

Frequency Missing = 15

Group motivated me to do my share

QD3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	148	75.5	148	75.5
Probably	31	15.8	179	91.3
Disagree	17	8.7	196	100.0

Frequency Missing = 7

22 The SAS System

1999 11:25 Tuesday, September 28,

Group members' contributions useful

QA7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	77	39.7	77	39.7
Probably	78	40.2	155	79.9
Disagree	39	20.1	194	100.0

Frequency Missing = 9

Easier after mind map drawn

QE5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	153	78.9	153	78.9
Probably	28	14.4	181	93.3
Disagree	13	6.7	194	100.0

Frequency Missing = 9

Team mind maps include relevant info

QE4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	138	71.1	138	71.1
Probably	40	20.6	178	91.8
Disagree	16	8.2	194	100.0

Frequency Missing = 9

Learnt working in team

QF7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	147	77.4	147	77.4
Probably	36	18.9	183	96.3
Disagree	7	3.7	190	100.0

Frequency Missing = 13

The SAS System

11:25 Tuesday, September 28, 1999

Gained insight into strenghts+weaknesses

QF8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	150	78.1	150	78.1
Probably	35	18.2	185	96.4
Disagree	7	3.6	192	100.0

Frequency Missing = 11

Gained insight into team role

QF1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	130	68.1	130	68.1
Probably	48	25.1	178	93.2
Disagree	13	6.8	191	100.0

Frequency Missing = 12

Degree

QG7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
BSc.	124	66.7	124	66.7
BComm.	62	33.3	186	100.0

Frequency Missing = 17

Enjoyed working in a group

QD2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	129	65.8	129	65.8
Probably	45	23.0	174	88.8
Disagree	22	11.2	196	100.0

Frequency Missing = 7

Members understand my comments

QB2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	143	73.3	143	73.3
Probably	43	22.1	186	95.4
Disagree	9	4.6	195	100.0

Frequency Missing = 8

I am influenced by group members

QC6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	84	42.9	84	42.9
Probably	74	37.8	158	80.6
Disagree	38	19.4	196	100.0

Frequency Missing = 7

I liked the way the class was conducted

QI13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	133	69.6	133	69.6
Probably	37	19.4	170	89.0
Disagree	21	11.0	191	100.0

Frequency Missing = 12

Share info with group members

QA10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	158	80.6	158	80.6
Probably	30	15.3	188	95.9
Disagree	8	4.1	196	100.0

Frequency Missing = 7

25 The SAS System

1999 11:25 Tuesday, September 28,

YR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
85	1	0.5	1	0.5
89	1	0.5	2	1.0
90	2	1.0	4	2.0
91	3	1.5	7	3.4
92	6	3.0	13	6.4
93	12	5.9	25	12.3
94	56	27.6	81	39.9
95	60	29.6	141	69.5
96	37	18.2	178	87.7
97	24	11.8	202	99.5
98	1	0.5	203	100.0

Gender versus some significant questions

The SAS System
11:25 Tuesday, September 28, 1999

TABLE OF QG1 BY GRP

QG1(Gender)	GRP		
Frequency, Percent, Row Pct, Col Pct	C	S	Total
Female	38	54	92
	19.69	27.98	47.67
	41.30	58.70	
	41.76	52.94	
Male	53	48	101
	27.46	24.87	52.33
	52.48	47.52	
	58.24	47.06	
Total	91	102	193
	47.15	52.85	100.00

Frequency Missing = 10

STATISTICS FOR TABLE OF QG1 BY GRP

Statistic	DF	Value	Prob
Chi-Square	1	**2.411**	**0.120**
Likelihood Ratio Chi-Square	1	2.417	0.120
Continuity Adj. Chi-Square	1	1.984	0.159
Mantel-Haenszel Chi-Square	1	2.399	0.121
Fisher's Exact Test (Left)			0.079
(Right)			0.955
(2-Tail)			0.149
Phi Coefficient		-0.112	
Contingency Coefficient		0.111	
Cramer's V		-0.112	

Effective Sample Size = 193
Frequency Missing = 10

Note this is not a significant finding but just shows the ratio of females versus males in the Computer Science and Statistics groupings.

The SAS System
11:25 Tuesday, September 28, 1999

TABLE OF QG1 BY QI11

QG1(Gender) QI11(Access Internet regularly)

Frequency, Percent, Row Pct, Col Pct	Agree	Probably	Disagree	Total
Female	26	29	35	90
	13.76	15.34	18.52	47.62
	28.89	32.22	38.89	
	32.50	54.72	62.50	
Male	54	24	21	99
	28.57	12.70	11.11	52.38
	54.55	24.24	21.21	
	67.50	45.28	37.50	
Total	80	53	56	189
	42.33	28.04	29.63	100.00

Frequency Missing = 14

STATISTICS FOR TABLE OF QG1 BY QI11

Statistic	DF	Value	Prob
Chi-Square	**2**	**13.373**	**0.001**
Likelihood Ratio Chi-Square	2	13.592	0.001
Mantel-Haenszel Chi-Square	1	12.518	0.001
Phi Coefficient		0.266	
Contingency Coefficient		0.257	
Cramer's V		0.266	

Effective Sample Size = 189
Frequency Missing = 14

The SAS System
11:25 Tuesday, September 28, 1999

TABLE OF QG1 BY QF7

QG1(Gender) QF7(Learnt working in team)

Frequency, Percent, Row Pct, Col Pct	Agree	Probably	Disagree	Total
Female	74	15	0	89
	39.36	7.98	0.00	47.34
	83.15	16.85	0.00	
	51.03	41.67	0.00	
Male	71	21	7	99
	37.77	11.17	3.72	52.66
	71.72	21.21	7.07	
	48.97	58.33	100.00	
Total	145	36	7	188
	77.13	19.15	3.72	100.00

Frequency Missing = 15

STATISTICS FOR TABLE OF QG1 BY QF7

Statistic	DF	Value	Prob
Chi-Square	**2**	**7.552**	**0.023**
Likelihood Ratio Chi-Square	2	10.239	0.006
Mantel-Haenszel Chi-Square	1	5.916	0.015
Phi Coefficient		0.200	
Contingency Coefficient		0.197	
Cramer's V		0.200	

Effective Sample Size = 188
Frequency Missing = 15
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Frequencies of the role groupings for the Computer Science group and the Statistics group.

---------- GRP=Computer Science----------

ROLE1 _ 4 GROUPINGS

TEAMS1_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CONTROL	30	30.6	30	30.6
IDEAS	33	33.7	63	64.3
LEADERSHIP	16	16.3	79	80.6
SUPPORT	19	19.4	98	100.0

ROLE1 _ 3 GROUPINGS

TEAMS1_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
ACTING	37	37.8	37	37.8
SOCIAL	20	20.4	57	58.2
THINKING	41	41.8	98	100.0

ROLE1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Compl Finish	6	6.1	6	6.1
Co-ordinator	3	3.1	9	9.2
Implementer	18	18.4	27	27.6
Monit Eval	6	6.1	33	33.7
Plant	29	29.6	62	63.3
Resource Invest	4	4.1	66	67.3
Shaper	13	13.3	79	80.6
Specialist	6	6.1	85	86.7
Team Worker	13	13.3	98	100.0

ROLE2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Compl Finish	7	7.1	7	7.1
Co-ordinator	6	6.1	13	13.3
Implementer	15	15.3	28	28.6
Monit Eval	10	10.2	38	38.8
Plant	19	19.4	57	58.2
Resource Invest	6	6.1	63	64.3
Shaper	15	15.3	78	79.6
Specialist	6	6.1	84	85.7
Team Worker	14	14.3	98	100.0

A high representation of the control role (30.6%) and ideas role (33.7%) in the Computer Science group may indicate that they will be able to develop and implement ideas. However with the low representation of leadership (16.3%) and social roles (19.4%) in this group, it is questionable if solutions to problems posed, would be client-orientated. When considering the

frequency of role 1 (the most dominant role) of this group it reaffirms the above contention. Investigative and ability to listen with insight need to be developed, as the natural representation of these skills in this group is low.

Appendix D

NO DUPLICATE STUDENTS FOR 97 AND 98
13:56 Tuesday, September 21, 1999

---------- GRP=Statistics----------

ROLE1 _ 4 GROUPINGS

TEAMS1_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CONTROL	27	25.7	27	25.7
IDEAS	31	29.5	58	55.2
LEADERSHIP	23	21.9	81	77.1
SUPPORT	24	22.9	105	100.0

ROLE1 _ 3 GROUPINGS

TEAMS1_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
ACTING	38	36.2	38	36.2
SOCIAL	30	28.6	68	64.8
THINKING	37	35.2	105	100.0

ROLE1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Compl Finish	2	1.9	2	1.9
Co-ordinator	2	1.9	4	3.8
Implementer	15	14.3	19	18.1
Monit Eval	10	9.5	29	27.6
Plant	27	25.7	56	53.3
Resource Invest	4	3.8	60	57.1
Shaper	21	20.0	81	77.1
Team Worker	24	22.9	105	100.0

ROLE2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Compl Finish	9	8.6	9	8.6
Co-ordinator	4	3.8	13	12.4
Implementer	15	14.3	28	26.7
Monit Eval	3	2.9	31	29.5
Plant	17	16.2	48	45.7
Resource Invest	12	11.4	60	57.1
Shaper	12	11.4	72	68.6
Specialist	13	12.4	85	81.0
Team Worker	20	19.0	105	100.0

The students studying Statistics seem to be a more diverse group with a more balanced representation in all the role-groupings. When considering each student's two most dominant team roles, it seems as if assertive leadership and implementation skills are well represented within the group, but that there is a shortage of coordinating and analytical skills.

Mark comparisons within role groupings

NO DUPLICATE STUDENTS FOR 97 AND 98

13:56 Tuesday, September 21, 1999

Analysis Variable : MARK

ROLE1 _ 4 GROUPINGS=CONTROL

N	Mean	Std Dev	Minimum	Maximum
57	61.22	11.97	27.00	86.36

ROLE1 _ 4 GROUPINGS=IDEAS

N	Mean	Std Dev	Minimum	Maximum
64	63.42	11.28	46.00	91.00

ROLE1 _ 4 GROUPINGS=LEADERSHIP

N	Mean	Std Dev	Minimum	Maximum
39	64.76	10.28	45.00	89.00

ROLE1 _ 4 GROUPINGS=SUPPORT

N	Mean	Std Dev	Minimum	Maximum
43	60.47	12.05	26.00	87.00

Analysis Variable : MARK

ROLE1 _ 3 GROUPINGS=ACTING

N	Mean	Std Dev	Minimum	Maximum
75	63.54	11.86	27.00	89.00

ROLE1 _ 3 GROUPINGS=SOCIAL

N	Mean	Std Dev	Minimum	Maximum
50	61.51	11.71	26.00	87.00

ROLE1 _ 3 GROUPINGS=THINKING

N	Mean	Std Dev	Minimum	Maximum
78	61.97	11.05	39.00	91.00

NO DUPLICATE STUDENTS FOR 97 AND 98

13:56 Tuesday, September 21, 1999

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable MARK
Classified by Variable TEAMS1_4

TEAMS1_4	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
CONTROL	57	5661.50000	5814.0	375.919673	99.324561
LEADERSH	39	4448.50000	3978.0	329.560707	114.064103
IDEAS	64	6650.50000	6528.0	388.667821	103.914063
SUPPORT	43	3945.50000	4386.0	341.802644	91.755814

Average Scores Were Used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ = 3.1421 DF = 3 Prob > CHISQ = 0.3702

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable MARK
Classified by Variable TEAMS1_3

TEAMS1_3	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
ACTING	75	8245.0	7650.0	403.753979	109.933333
SOCIAL	50	4899.0	5100.0	360.422518	97.980000
THINKING	78	7562.0	7956.0	406.896081	96.948718

Average Scores Were Used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ = 2.1811 DF = 2 Prob > CHISQ = 0.3360

The first Belbin role in each student's teamrole profile was used to place a student within a category. Achievement is not related to a specific category.

NO DUPLICATE STUDENTS FOR 97 AND 98

1999 13:56 Tuesday, September 21,

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable MARK
Classified by Variable TEAMS1_4

TEAMS1_4	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
CONTROL	57	5661.50000	5814.0	375.919673	99.324561
LEADERSH	39	4448.50000	3978.0	329.560707	114.064103
IDEAS	64	6650.50000	6528.0	388.667821	103.914063
SUPPORT	43	3945.50000	4386.0	341.802644	91.755814

Average Scores Were Used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ = 3.1421 DF = 3 Prob > CHISQ = 0.3702

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable MARK
Classified by Variable TEAMS1_3

TEAMS1_3	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
ACTING	75	8245.0	7650.0	403.753979	109.933333
SOCIAL	50	4899.0	5100.0	360.422518	97.980000
THINKING	78	7562.0	7956.0	406.896081	96.948718

Average Scores Were Used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ = 2.1811 DF = 2 Prob > CHISQ = 0.3360

The first Belbin role in each student's teamrole profile was used to place a student within a category. Achievement is not related to a specific category.

NO DUPLICATE STUDENTS FOR 97 AND 98
09:45 Tuesday, September 21, 1999

ROLE1 _ 4 GROUPINGS

TEAMS1_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
.	20	9.0	20	9.0
CONTROL	57	25.6	77	34.5
IDEAS	64	28.7	141	63.2
LEADERSHIP	39	17.5	180	80.7
SUPPORT	43	19.3	223	100.0

ROLE1 _ 3 GROUPINGS

TEAMS1_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
.	20	9.0	20	9.0
ACTING	75	33.6	95	42.6
SOCIAL	50	22.4	145	65.0
THINKING	78	35.0	223	100.0

ROLE2 _ 4 GROUPINGS

TEAMS2_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
.	20	9.0	20	9.0
CONTROL	59	26.5	79	35.4
IDEAS	54	24.2	133	59.6
LEADERSHIP	37	16.6	170	76.2
SUPPORT	53	23.8	223	100.0

ROLE2 _ 3 GROUPINGS

TEAMS2_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
.	20	9.0	20	9.0
ACTING	73	32.7	93	41.7
SOCIAL	62	27.8	155	69.5
THINKING	68	30.5	223	100.0

NO DUPLICATE STUDENTS FOR 97 AND 98
ROLE3 _ 4 GROUPINGS

TEAMS3_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
.	20	9.0	20	9.0
CONTROL	58	26.0	78	35.0
IDEAS	44	19.7	122	54.7
LEADERSHIP	44	19.7	166	74.4
SUPPORT	57	25.6	223	100.0

Frequencies of the dominant Belbin roles

(All 1997 and 1998 data were used – only one record per student, all duplicates deleted.)

Frequencies of the three dominant roles are given. These three roles are then grouped into four groupings (control, ideas, leadership and support) as well as three groupings (acting, social and thinking).

ROLE1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CF	8	3.9	8	3.9
CO	5	2.5	13	6.4
IMP	33	16.3	46	22.7
ME	16	7.9	62	30.5
PL	56	27.6	118	58.1
RI	8	3.9	126	62.1
SH	34	16.7	160	78.8
SP	6	3.0	166	81.8
TW	37	18.2	203	100.0

Frequency Missing = 20

ROLE2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CF	16	7.9	16	7.9
CO	10	4.9	26	12.8
IMP	30	14.8	56	27.6
ME	13	6.4	69	34.0
PL	36	17.7	105	51.7
RI	18	8.9	123	60.6
SH	27	13.3	150	73.9
SP	19	9.4	169	83.3
TW	34	16.7	203	100.0

Frequency Missing = 20

ROLE3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CF	20	9.9	20	9.9
CO	21	10.3	41	20.2
IMP	21	10.3	62	30.5
ME	17	8.4	79	38.9
PL	27	13.3	106	52.2
RI	17	8.4	123	60.6
SH	23	11.3	146	71.9
SP	25	12.3	171	84.2
TW	32	15.8	203	100.0

Frequency Missing = 20

ROLE3 _ 3 GROUPINGS

TEAMS3_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
.	20	9.0	20	9.0
ACTING	64	28.7	84	37.7
SOCIAL	70	31.4	154	69.1
THINKING	69	30.9	223	100.0

In the next tables cross-tabulation is done with the following:

TEAMS1_4 (ROLE1 is grouped into four categories namely, control, ideas, leadership and support). This is cross-tabulated with TEAMS2_4 (ROLE2 also grouped into these same four categories).

Table TEAMS1_4 BY TEAMS2_4:

It is interesting to note that if the first role falls within a control category, the second does not (4.04%). The highest second role of this grouping is the support category (38.6%). If the support category is the most dominant the second role is NOT in the support category (4.65%), but the second dominant category is mostly the control category. If the first role is in the ideas category, the second role is not prominent in a specific category (control (26.6%), leadership (29.7%), support (29.7%)). If the first role falls within the leadership category, the second role is mostly in the Ideas category (38.5%).

TABLE OF TEAMS1_4 BY TEAMS2_4

TEAMS1_4(ROLE1 _ 4 GROUPINGS)	TEAMS2_4(ROLE2 _ 4 GROUPINGS)				
Frequency , Percent , Row Pct , Col Pct	CONTROL	IDEAS	LEADERSHIP	SUPPORT	Total
.	20	0	0	0	0	20
	8.97	0.00	0.00	0.00	0.00	8.97
	100.00	0.00	0.00	0.00	0.00	
	100.00	0.00	0.00	0.00	0.00	
CONTROL	0	9	13	13	22	57
	0.00	4.04	5.83	5.83	9.87	25.56
	0.00	15.79	22.81	22.81	38.60	
	0.00	15.25	24.07	35.14	41.51	
IDEAS	0	17	9	19	19	64
	0.00	7.62	4.04	8.52	8.52	28.70
	0.00	***26.56***	***14.06***	***29.69***	***29.69***	
	0.00	28.81	16.67	51.35	35.85	
LEADERSHIP	0	13	15	1	10	39
	0.00	5.83	6.73	0.45	4.48	17.49
	0.00	*33.33*	38.46	2.56	25.64	
	0.00	22.03	27.78	2.70	18.87	
SUPPORT	0	20	17	4	2	43
	0.00	8.97	7.62	1.79	0.90	19.28
	0.00	46.51	39.53	9.30	4.65	
	0.00	33.90	31.48	10.81	3.77	
Total	20	59	54	37	53	223
	8.97	26.46	24.22	16.59	23.77	100.00

In this section TEAMS1_4 (ROLE1 is grouped into four categories, namely control, ideas, leadership and support) is cross-tabulated with TEAMS3_4 (ROLE3 is also grouped into these same four categories).

In table TEAMS1_4 BY TEAMS3_4 :

TABLE OF TEAMS1_4 BY TEAMS3_4

TEAMS1_4(ROLE1 _ 4 GROUPINGS) TEAMS3_4(ROLE3 _ 4 GROUPINGS)

Frequency / Percent / Row Pct / Col Pct	CONTROL	IDEAS	LEADERSHIP	SUPPORT	Total
.	20	0	0	0	20
	8.97	0.00	0.00	0.00	8.97
	100.00	0.00	0.00	0.00	
	100.00	0.00	0.00	0.00	
CONTROL	0	8	13	16	20	57
	0.00	3.59	5.83	7.17	8.97	25.56
	0.00	14.04	22.81	28.07	35.09	
	0.00	13.79	29.55	36.36	35.09	
IDEAS	0	21	7	16	20	64
	0.00	9.42	3.14	7.17	8.97	28.70
	0.00	32.81	10.94	25.00	31.25	
	0.00	36.21	15.91	36.36	35.09	
LEADERSHIP	0	15	9	1	14	39
	0.00	6.73	4.04	0.45	6.28	17.49
	0.00	38.46	23.08	2.56	35.90	
	0.00	25.86	20.45	2.27	24.56	
SUPPORT	0	14	15	11	3	43
	0.00	6.28	6.73	4.93	1.35	19.28
	0.00	32.56	34.88	25.58	6.98	
	0.00	24.14	34.09	25.00	5.26	
Total	20	58	44	44	57	223
	8.97	26.01	19.73	19.73	25.56	100.00

It is interesting to note that if the 1st role is in the control category, the 3rd is mostly again in the support category. If the 1st role is in the support category, the 3rd role is either in the control or the ideas category. Similarly, if the 1st role is in the leadership category, the 3rd role is either in the control or support category.

In table TEAMS2_4 BY TEAMS3_4 :

NO DUPLICATE STUDENTS FOR 97 AND 98

TABLE OF TEAMS2_4 BY TEAMS3_4

TEAMS2_4(ROLE2 _ 4 GROUPINGS)	TEAMS3_4(ROLE3 _ 4 GROUPINGS)				
Frequency / Percent / Row Pct / Col Pct	CONTROL	IDEAS	LEADERSH IP	SUPPORT	Total
.	20	0	0	0	20
	8.97	0.00	0.00	0.00	8.97
	100.00	0.00	0.00	0.00	
	100.00	0.00	0.00	0.00	
CONTROL	0	14	13	14	18	59
	0.00	6.28	5.83	6.28	8.07	26.46
	0.00	23.73	22.03	23.73	30.51	
	0.00	24.14	29.55	31.82	31.58	
IDEAS	0	19	7	12	16	54
	0.00	8.52	3.14	5.38	7.17	24.22
	0.00	35.19	12.96	22.22	29.63	
	0.00	32.76	15.91	27.27	28.07	
LEADERSHIP	0	11	11	4	11	37
	0.00	4.93	4.93	1.79	4.93	16.59
	0.00	29.73	29.73	10.81	29.73	
	0.00	18.97	25.00	9.09	19.30	
SUPPORT	0	14	13	14	12	53
	0.00	6.28	5.83	6.28	5.38	23.77
	0.00	26.42	24.53	26.42	22.64	
	0.00	24.14	29.55	31.82	21.05	
Total	20	58	44	44	57	223
	8.97	26.01	19.73	19.73	25.56	100.00

In the next section cross-tabulation is done with the following:

TEAMS1_3 (ROLE1 is grouped into three categories, namely acting, social and thinking). This is cross-tabulated with TEAMS2_3 (ROLE2 is also grouped into these same three categories). In table TEAMS1_3 BY TEAMS2_3 :

If the 1st role is in the acting category, the 2nd role falls mostly within the thinking category (40%). If the 1st role is in the social category, the 2nd role is mostly in the acting category (44%). If the 1st role is in the thinking category. Interestingly the 2nd role is in the acting category (41%).

NO DUPLICATE STUDENTS FOR 97 AND 98

TABLE OF TEAMS1_3 BY TEAMS2_3

TEAMS1_3(ROLE1 _ 3 GROUPINGS) TEAMS2_3(ROLE2 _ 3 GROUPINGS)

Frequency, Percent , Row Pct , Col Pct	.	ACTING	SOCIAL	THINKING	Total
.	20	0	0	0	20
	8.97	0.00	0.00	0.00	8.97
	100.00	0.00	0.00	0.00	
	100.00	0.00	0.00	0.00	
ACTING	0	19	26	30	75
	0.00	8.52	11.66	13.45	33.63
	0.00	25.33	34.67	40.00	
	0.00	26.03	41.94	44.12	
SOCIAL	0	22	12	16	50
	0.00	9.87	5.38	7.17	22.42
	0.00	44.00	24.00	32.00	
	0.00	30.14	19.35	23.53	
THINKING	0	32	24	22	78
	0.00	14.35	10.76	9.87	34.98
	0.00	41.03	30.77	28.21	
	0.00	43.84	38.71	32.35	
Total	20	73	62	68	223
	8.97	32.74	27.80	30.49	100.00

NO DUPLICATE STUDENTS FOR 97 AND 98

TABLE OF TEAMS1_3 BY TEAMS3_3

TEAMS1_3(ROLE1 _ 3 GROUPINGS) TEAMS3_3(ROLE3 _ 3 GROUPINGS)

Frequency, Percent, Row Pct, Col Pct	ACTING	SOCIAL	THINKING	Total
.	20	0	0	20
	8.97	0.00	0.00	8.97
	100.00	0.00	0.00	
	100.00	0.00	0.00	
ACTING	0	17	25	33	75
	0.00	7.62	11.21	14.80	33.63
	0.00	22.67	33.33	44.00	
	0.00	26.56	35.71	47.83	
SOCIAL	0	19	11	20	50
	0.00	8.52	4.93	8.97	22.42
	0.00	38.00	22.00	40.00	
	0.00	29.69	15.71	28.99	
THINKING	0	28	34	16	78
	0.00	12.56	15.25	7.17	34.98
	0.00	35.90	43.59	20.51	
	0.00	43.75	48.57	23.19	
Total	20	64	70	69	223
	8.97	28.70	31.39	30.94	100.00

NO DUPLICATE STUDENTS FOR 97 AND 98

TABLE OF TEAMS2_3 BY TEAMS3_3

TEAMS2_3(ROLE2 _ 3 GROUPINGS) TEAMS3_3(ROLE3 _ 3 GROUPINGS)

Frequency, Percent , Row Pct , Col Pct	,.	,ACTING	,SOCIAL	,THINKING,	Total
.	20	0	0	0	20
	8.97	0.00	0.00	0.00	8.97
	100.00	0.00	0.00	0.00	
	100.00	0.00	0.00	0.00	
ACTING	0	23	28	22	73
	0.00	10.31	12.56	9.87	32.74
	0.00	31.51	38.36	30.14	
	0.00	35.94	40.00	31.88	
SOCIAL	0	20	16	26	62
	0.00	8.97	7.17	11.66	27.80
	0.00	32.26	25.81	41.94	
	0.00	31.25	22.86	37.68	
THINKING	0	21	26	21	68
	0.00	9.42	11.66	9.42	30.49
	0.00	30.88	38.24	30.88	
	0.00	32.81	37.14	30.43	
Total	20	64	70	69	223
	8.97	28.70	31.39	30.94	100.00

NO DUPLICATE STUDENTS FOR 97 AND 98 59

TABLE 2 OF TEAMS2_4 BY TEAMS3_4

CONTROLLING FOR TEAMS1_4=CONTROL

Note that we are now investigating the relationship between roles 2 and 3 if the 1st role is in the control category. A total of 57 students had their 1st role in the control category and therefore one should note that the sample sizes in each cell are small.

TEAMS2_4(ROLE2 _ 4 GROUPINGS)	TEAMS3_4(ROLE3 _ 4 GROUPINGS)					
Frequency Percent Row Pct Col Pct	. .	CONTROL .	IDEAS .	LEADERSH IP	SUPPORT .	Total
.	0 0.00 . .	0 0.00 . 0.00	0 0.00 . 0.00	0 0.00 . 0.00	0 0.00 . 0.00	0 0.00
CONTROL	0 0.00 0.00 .	0 0.00 **0.00** 0.00	3 5.26 33.33 23.08	1 1.75 11.11 6.25	**5** 8.77 *55.56* 25.00	9 15.79
IDEAS	0 0.00 0.00 .	1 1.75 7.69 12.50	2 3.51 15.38 15.38	3 5.26 23.08 18.75	7 12.28 53.85 35.00	13 22.81
LEADERSHIP	0 0.00 0.00 .	4 7.02 30.77 50.00	3 5.26 23.08 23.08	3 5.26 23.08 18.75	3 5.26 23.08 15.00	13 22.81
SUPPORT	0 0.00 0.00 .	3 5.26 13.64 37.50	5 8.77 22.73 38.46	9 15.79 40.91 56.25	5 8.77 22.73 25.00	22 38.60
Total	0 0.00	8 14.04	13 22.81	16 28.07	20 35.09	57 100.00

It is interesting that if the 1st role is in the control category, neither the 2nd nor the 3rd role is in the control category.

NO DUPLICATE STUDENTS FOR 97 AND 98

TABLE 3 OF TEAMS2_4 BY TEAMS3_4

CONTROLLING FOR TEAMS1_4=IDEAS

Note that we are now investigating the relationship between roles 2 and 3 if the 1st role is in the ideas category. There were a total of 64 students with their 1st role in the ideas category and therefore one should note that the sample sizes in each cell are small.

TEAMS2_4(ROLE2 _ 4 GROUPINGS)	TEAMS3_4(ROLE3 _ 4 GROUPINGS)				
Frequency Percent Row Pct Col Pct	. .	CONTROL .	IDEAS .	LEADERSH IP .	SUPPORT .	Total
.	0 0.00 .	0 0.00 .	0 0.00 .	0 0.00 .	0 0.00 .	0 0.00
CONTROL	0 0.00 0.00 .	5 7.81 29.41 23.81	0 0.00 0.00 0.00	6 9.38 35.29 37.50	6 9.38 35.29 30.00	17 26.56
IDEAS	0 0.00 0.00 .	1 1.56 11.11 4.76	0 0.00 0.00 0.00	5 7.81 55.56 31.25	3 4.69 33.33 15.00	9 14.06
LEADERSHIP	0 0.00 0.00 .	6 9.38 31.58 28.57	4 6.25 21.05 57.14	1 1.56 5.26 6.25	8 12.50 42.11 40.00	19 29.69
SUPPORT	0 0.00 0.00 .	9 14.06 47.37 42.86	3 4.69 15.79 42.86	4 6.25 21.05 25.00	3 4.69 15.79 15.00	19 29.69
Total	0 0.00	21 32.81	7 10.94	16 25.00	20 31.25	64 100.00

It is interesting that if the 1st role is in the ideas category, neither the 2nd nor the 3rd role is in the ideas category.

NO DUPLICATE STUDENTS FOR 97 AND 98

TABLE 4 OF TEAMS2_4 BY TEAMS3_4

CONTROLLING FOR TEAMS1_4=LEADERSHIP

Note that we are now investigating the relationship between roles 2 and 3 if the 1st role is in the leadership category. There were a total of 39 students with their 1st role in the leadership category and therefore one should be note that the sample sizes in each cell are small.

TEAMS2_4(ROLE2 _ 4 GROUPINGS)	TEAMS3_4(ROLE3 _ 4 GROUPINGS)				
Frequency Percent Row Pct Col Pct	CONTROL	IDEAS	LEADERSH IP	SUPPORT	Total
.	0 0.00 . .	0 0.00 . 0.00	0 0.00 . 0.00	0 0.00 . 0.00	0 0.00 . .
CONTROL	0 0.00 0.00 .	3 7.69 23.08 20.00	4 10.26 30.77 44.44	1 2.56 7.69 100.00	5 12.82 38.46 35.71	13 33.33
IDEAS	0 0.00 0.00 .	9 23.08 60.00 60.00	1 2.56 6.67 11.11	0 0.00 0.00 0.00	5 12.82 33.33 35.71	15 38.46
LEADERSHIP	0 0.00 0.00 .	1 2.56 100.00 6.67	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	1 2.56
SUPPORT	0 0.00 0.00 .	2 5.13 20.00 13.33	4 10.26 40.00 44.44	0 0.00 0.00 0.00	4 10.26 40.00 28.57	10 25.64
Total	0 0.00	15 38.46	9 23.08	1 2.56	14 35.90	39 100.00

It is interesting that if the 1st role is in the leadership category, neither the 2nd nor the 3rd role is in the leadership category.

NO DUPLICATE STUDENTS FOR 97 AND 98

TABLE 5 OF TEAMS2_4 BY TEAMS3_4

CONTROLLING FOR TEAMS1_4=SUPPORT

Note that we are now investigating the relationship between roles 2 and 3 if the 1st role is in the support category. There were a total of 43 students with their 1st role in the support category and therefore one should be note that the sample sizes in each cell are small.

TEAMS2_4(ROLE2 _ 4 GROUPINGS)	TEAMS3_4(ROLE3 _ 4 GROUPINGS)				
Frequency , Percent , Row Pct , Col Pct	. CONTROL	IDEAS	LEADERSH, IP	SUPPORT	Total
.	0 0.00 . .	0 0.00 . 0.00	0 0.00 . 0.00	0 0.00 . 0.00	0 0.00
CONTROL	0 0.00 0.00 .	6 13.95 30.00 42.86	6 13.95 30.00 40.00	6 13.95 30.00 54.55	2 4.65 10.00 66.67	20 46.51
IDEAS	0 0.00 0.00 .	8 18.60 47.06 57.14	4 9.30 23.53 26.67	4 9.30 23.53 36.36	1 2.33 5.88 33.33	17 39.53
LEADERSHIP	0 0.00 0.00 .	0 0.00 0.00 0.00	4 9.30 100.00 26.67	0 0.00 0.00 0.00	0 0.00 0.00 0.00	4 9.30
SUPPORT	0 0.00 0.00 .	0 0.00 0.00 0.00	1 2.33 50.00 6.67	1 2.33 50.00 9.09	0 **0.00** 0.00 0.00	2 4.65
Total	0 0.00	14 32.56	15 34.88	11 25.58	3 6.98	43 100.00

To summarize, 57 students have their first role in the control category, 64 in the ideas category, 39 in the leadership category and 43 in the support category. For all these categories, if the 1st role is in a category, the 2nd and the 3rd role are not in the same category.

NO DUPLICATE STUDENTS FOR 97 AND 98

09:45 Tuesday, September 21, 1999

TABLE 2 OF TEAMS2_3 BY TEAMS3_3

CONTROLLING FOR TEAMS1_3=ACTING

Note that we are now investigating the relationship between roles 2 and 3 if the 1st role is in the acting category. There were a total of 75 students with their 1st role in the acting category and therefore one should note that the sample sizes in each cell are small.

TEAMS2_3(ROLE2 _ 3 GROUPINGS)	TEAMS3_3(ROLE3 _ 3 GROUPINGS)				
Frequency, Percent, Row Pct, Col Pct	ACTING	SOCIAL	THINKING	Total
.	0	0	0	0	0
	0.00	0.00	0.00	0.00	0.00
	.	.	.	.	
	.	0.00	0.00	0.00	
ACTING	0	4	9	6	19
	0.00	5.33	12.00	8.00	25.33
	0.00	**21.05**	**47.37**	31.58	
	.	23.53	36.00	18.18	
SOCIAL	0	8	6	12	26
	0.00	10.67	8.00	16.00	34.67
	0.00	30.77	23.08	**46.15**	
	.	47.06	24.00	36.36	
THINKING	0	5	10	15	30
	0.00	6.67	13.33	20.00	40.00
	0.00	16.67	33.33	**50.00**	
	.	29.41	40.00	45.45	
Total	0	17	25	33	75
	0.00	22.67	33.33	44.00	100.00

NO DUPLICATE STUDENTS FOR 97 AND 98
09:45 Tuesday, September 21, 1999

TABLE 3 OF TEAMS2_3 BY TEAMS3_3

CONTROLLING FOR TEAMS1_3=SOCIAL

TEAMS2_3(ROLE2 _ 3 GROUPINGS) TEAMS3_3(ROLE3 _ 3 GROUPINGS)

Frequency, Percent, Row Pct, Col Pct	ACTING	SOCIAL	THINKING	Total
.	0	0	0	0
	0.00	0.00	0.00	0.00
	.	.	.	
	.	0.00	0.00	0.00
ACTING	0	8	5	9	22
	0.00	16.00	10.00	18.00	44.00
	0.00	36.36	22.73	**40.91**	
	.	42.11	45.45	45.00	
SOCIAL	0	4	0	8	12
	0.00	8.00	0.00	16.00	24.00
	0.00	33.33	**0.00**	**66.67**	
	.	21.05	0.00	40.00	
THINKING	0	7	6	3	16
	0.00	14.00	12.00	6.00	32.00
	0.00	**43.75**	**37.50**	18.75	
	.	36.84	54.55	15.00	
Total	0	19	11	20	50
	0.00	38.00	22.00	40.00	100.00

NO DUPLICATE STUDENTS FOR 97 AND 98

TABLE 4 OF TEAMS2_3 BY TEAMS3_3

CONTROLLING FOR TEAMS1_3=THINKING

GROUPINGS)	TEAMS2_3(ROLE2 _ 3 GROUPINGS)	TEAMS3_3(ROLE3 _ 3

Frequency, Percent , Row Pct , Col Pct ,	ACTING	SOCIAL	THINKING	Total
.	0	0	0	0
	0.00	0.00	0.00	0.00
	.	.	.	
	.	0.00	0.00	0.00
ACTING	0	11	14	7	32
	0.00	14.10	17.95	8.97	41.03
	0.00	34.38	**43.75**	21.88	
	.	39.29	41.18	43.75	
SOCIAL	0	8	10	6	24
	0.00	10.26	12.82	7.69	30.77
	0.00	33.33	41.67	25.00	
	.	28.57	29.41	37.50	
THINKING	0	9	10	3	22
	0.00	11.54	12.82	3.85	28.21
	0.00	**40.91**	**45.45**	13.64	
	.	32.14	29.41	18.75	
Total	0	28	34	16	78
	0.00	35.90	43.59	20.51	100.00

To summarize, 75 students have their first role in the acting category, 50 in the social category and 78 in the thinking category. No specific relationship emerged from these comparisons. It is interesting to note that if the 1st role is in the social category, neither the 2nd nor the 3rd role falls within the social category.