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To establish normative data using the Jebsen Taylor hand function test (JHFT) for normal, ethnically diverse South Africans aged between 20 and 59 years

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2009-05-06T13:27:56Z
http://hdl.handle.net/10539/6931

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APPENDIX A

METHOD FOR APPLICATION OF JHFT[2]

- All subtests will be administered in precisely the same manner to all subjects
- The time taken to complete the subtests will be measured using a stopwatch and recorded on data sheet (Appendix 1)
- Each subject will be seated on a 46cm high chair in front of a 76cm high table in a well lit area
- Instructions given and followed by specific questions to ensure instructions are understood as highlighted below (descriptions below have been written for a right handed subject)
- Tests will be presented in the same sequence
- Tests will always be performed with the nondominant hand first



Figure 5. Jebsen-Taylor Hand Function Test:
http://www.benefitsnowshop.co.uk/shop/detail/2357.htm

SUBTEST 1: WRITING

Procedure: The subject is given a black ballpoint pen and four A4 sheets of unruled white paper fastened, one on top of the other, to a clipboard. The sentence to be copied has 24 letters and is of 3rd grade reading difficulty. The sentence is typed in all capital letters and centred on a 5-by-8 inch index card. The card is presented with the typed side faced down. After the articles are arranged to the comfort of the subject (see instructions), the card is turned over by the examiner with an immediate command to begin. The item is timed from the word “go” until the pen is lifted from

the page at the end of the sentence. The item is repeated with the dominant hand using a new sentence.

Instructions: "Do you require glasses for reading? If so, put them on. Take this pen in your left hand and arrange everything so that it is comfortable for you to write with your left hand. On the other side of this card (indicate) is a sentence. When I turn the card over and say 'Go', write the sentence as quickly and as clearly as you can use your left hand. Write, do not print. Do you understand? Ready? Go."

For dominant hand: "All right, now repeat the same thing, only this time using your right hand. I have given you a different sentence. Are you ready? Go."

*Sentences used:
The old man seemed to be tired.
John saw the red truck coming.
Whales live in the blue ocean.
Fish take air out of the water.

SUBTEST 2: CARD TURNING (SIMULATED PAGE TURNING)
Procedure: Five 3-by-5 inch index cards, ruled on one side only, are placed in a horizontal row 5cm apart on the desk in front of the patient. Each card is oriented vertically, 5cm from the front edge of the desk. The distance is indicated on the side edge of the desk with a piece of tape. Timing is from the word "Go" until the last card is turned over. No accuracy of placement after turning is necessary. The item is repeated with the dominant hand.

Instructions: "Place your left hand on the table please. When I say 'Go', use your left hand to turn these cards over one at a time as quickly as you can, beginning with this one (indicate card to the extreme right). You may turn them over in any way that you wish and they need not be in a neat pattern when you finish. Do you understand? Ready? Go."

Dominant hand: "Now the same thing with the right hand beginning with this one (indicate extreme left card). Ready? Go."

SUBTEST 3: SMALL COMMON OBJECTS

Procedure: An empty coffee can is placed directly in front of the subject, 5" from the edge of the desk. Two paper clips (oriented vertically), two regular sized bottle caps (placed with the inside of the cap facing up), and 2 one-cent coins are placed in a horizontal row to the left of the can. The paper clips are to the extreme left and the pennies, nearest the can. The objects are 5cm apart. Timing is from the word "Go" until the sound of the last object striking the inside of the can is heard. The item is repeated with the dominant hand. The layout for the dominant hand is a mirror image of the one described, with the objects to the right of the can.

Instructions: "Place your left hand on the table please. When I say 'Go', use your left hand to pick up these objects one at a time and place then in the can as fast as you can. Beginning with this one (indicate paper clip on the extreme left). Do you understand? Ready? Go."

Dominant hand: "Now the same thing with the right hand beginning here (indicate paper clip now on the extreme right). Ready? Go."

SUBTEST 4: SIMULATED FEEDING

Procedure: Five kidney beans are placed on a board (a wooden board 105cm long, 29cm wide and 2cm thick secured to the desk using a "C" clamp. The front edge is marked at 10cm intervals for easy reference when placing objects. A centrepiece of plywood, 51cm long, 5cm high and 2cm thick is glued to the board 10cm from the right end and 15cm from the front of the board. The front of the centre upright should be marked at 5cm intervals beginning 2.5cm from each end for convenience in placing objects)* clamped to the desk in front of the subject 12.5cm from the front edge of the desk. The beans are oriented to the left of centre, parallel to and

touching the upright of the board 5cm apart. An empty coffee can is placed centrally in front of the board. A regular teaspoon is provided. Timing is from the word "Go" until the last bean is heard hitting the bottom of the can. The item is repeated with the dominant hand, the beans being placed on the right of centre.

Instructions: "Take the teaspoon in your left hand please. When I say, "Go", use your left hand to pick up these beans one at a time with the teaspoon and place them in the can as fast as you can beginning with this one (indicate bean on the extreme left). Do you understand? Ready? Go."

Dominant hand: "Now the same thing with the right hand beginning here (indicate bean on the extreme right). Ready? Go."

SUBTEST 5: CHECKERS

Procedure: Four standard sized wooden checkers are placed in front of and touching the board*(mentioned earlier) clamped to the desk in front of the subject, 12.5cm from the front edge of the desk. The checkers are oriented two on each side of the centre in a 0000 configuration. Timing is from the word "Go" until the fourth checker makes contact with the third checker. The fourth checker need not stay in place. The item is repeated with the dominant hand.

Instructions: "Place your left hand on the table please. When I say 'Go', use your left hand to stack these checkers on the board in front of you as fast as you can like this, one on top of the other (demonstrate). You may begin with any checker. Do you understand? Ready? Go."

Dominant hand: "Now the same thing with the right hand. Ready? Go."

SUBTEST 6: LARGE LIGHT OBJECTS

Procedure: Five no 303 empty baked beans cans are placed in front of a board clamped to the desk in front of the subject 12.5cm from the front edge of the desk.

The cans are spaced 5cm apart with the open end of the can facing down. Timing is from the word “Go” until the fifth can has been released. The item is repeated with the dominant hand.

Instructions: “Place your left hand on the table please. When I say ‘Go’, use your left hand to stand these cans on the board* in front of you, like this (demonstrate). Begin with this one (indicate can on extreme left). Do you understand? Ready? Go.”

Dominant hand: “Now the same thing with the right hand beginning here (indicate extreme right can). Ready? Go.”

SUBTEST 7: LARGE HEAVY OBJECTS

Procedure: 5 no 303 full baked beans cans are placed in front of a board* clamped to the desk in front of the subject 12.5cm from the front edge of the desk. The cans are spaced 5cm apart. Timing is from the word “Go” until the fifth can has been released. The item is repeated with the dominant hand.

Instructions: “Now do the same thing with these heavier cans. Place your left hand on the table. When I say ‘Go’, use your left hand to stand these cans on the board as fast as you can. Begin here (indicate can on extreme left). Do you understand? Ready? Go.”

Dominant hand: ““Now the same thing with the right hand beginning here (indicate extreme right can). Ready? Go.”

APPENDIX B

Interrater reliability - Mean times and Standard deviations for normal subjects

	Tester 1	Tester 2	Correlation Coefficient p values
Age	20-59	20-59	
Total nr of subjects	5	5	
D handwriting	12.40 +- 3.94	12.39 +- 3.97	0.01
D page turning	5.13 +- 1.12	5.13 +- 1.12	0.00
D small objects	5.43 +- 1.41	5.42 +- 1.41	0.01
D feeding	6.31 +- 1.31	6.32 +- 1.30	0.01
D draughts	2.48 +- 0.57	2.50 +- 0.57	0.01
D light objects	3.23 +- 0.65	3.21 +- 0.66	0.01
D heavy objects	3.30 +- 0.48	3.30 +- 0.47	0.00
ND handwriting	23.70 +- 12.35	23.72 +- 12.35	0.01
ND page turning	5.56 +- 1.05	5.56 +- 1.06	0.00
ND small objects	5.65 +- 1.05	5.61 +- 1.73	0.03
ND feeding	7.50 +- 1.13	7.52 +- 1.16	0.01
ND draughts	2.75 +- 0.62	2.74 +- 0.61	0.01
ND light objects	3.70 +- 0.91	3.71 +- 0.92	0.01
ND heavy objects	3.83 +- 0.54	3.85 +- 0.53	0.01

APPENDIX C

DATA COLLECTION FORM

Date:

Age: Dominant:

Sex: Race Group:

Screening:

	Within normal limits	**Deficits noted**
Anatomical restrictions		
Mental State		
Upper limb joint range of movement		
Muscle Strength		
Sensation		
Co-ordination		

Patient accepted for research: _____

Jebsen Sub tests

Subtests	Right hand (Time in seconds)	Left hand (Time in seconds)
1. Writing		
2. Simulated page turning		
3. Picking up small common objects		
4. Simulated feeding		
5. Stacking checkers (draughts)		
6. Picking up large light objects		
7. Picking up large heavy objects		

APPENDIX D



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Division of the Deputy Registrar (Research) Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL) HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

R14/49 Govender R14/49 Govender

PROTOCOL NUMBER CERTIFICATE PROTOCOL NUMBER CERTIFICATE

To establish normal PROJECT ing the Jebsen Taylor To establish normal PROJECT ing the Jebsen Taylor

diverse South Africans aged between 20 and 70 years old, ethnically diverse South Africans aged between 20 and 70 years old, ethnically

P Govender INVESTIGATORS P Govender INVESTIGATORS

Occupational Therapy DEPARTMENT Occupational Therapy DEPARTMENT

DATE CONSIDERED 04.02.27 DATE CONSIDERED 04.02.27

DECISION OF THE COMMITTEE* Approved unconditionally DECISION OF THE COMMITTEE* Approved unconditionally

For 5 years ~~and has to be review at expiration~~ this ethical clearance is valid for 5 years ~~and has to be review at expiration~~ this ethical clearance is valid for application. application.

DATE 04.04.20 CHAIRPERSON DATE 04.04.20 CHAIRPERSON

(Professor PE Cleaton-Jones) (Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable *Guidelines for written 'informed consent' attached where applicable

Mrs D Franzsen cc: Supervisor: Mrs D Franzsen cc: Supervisor

INVESTIGATOR(S) DECLARATION OF INVESTIGATOR(S) DECLARATION OF INVESTIGATOR(S)

ONE COPY returned to the Secretary ~~To be completed in duplicate~~ and ONE COPY returned to the Secretary ~~To be completed in duplicate~~

Senate House, University. Senate House, University.

under which I am/we are authorized ~~I/We fully understand the conditions~~ under which I am/we are authorized ~~I/We fully understand the conditions~~

compliance with these conditions. ~~Should any I/we give to be~~ to ensure compliance with these conditions. ~~Should any I/we give to be~~ to ensure co

approved I/we undertake to ~~contemplate from this research~~ procedure as approved I/we undertake to ~~contemplate from this research~~ procedure

yearly progress report. Committee: I agree to a completion of a yearly progress report. Committee: I agree to a completion of a yea

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APPENDIX E

SUBJECT INFORMATION AND INFORMED CONSENT FORM

Title of Research: To establish normative data using the Jebsen Taylor Hand Function Test for normal, ethnically diverse South Africans aged between 20 and 59 years old.

This research is being conducted by Paran Govender as part fulfilment of M.Sc in Occupational Therapy (Neurosciences). The Ethics Committee and Post Graduate Committee at the University of Witwatersrand have approved the study.

I hereby consent to participate in the aforementioned research study. I understand that I will be asked to participate in a number of tests that assesses hand function and that the assessment will take 20 minutes to complete.

I understand that once that from this point on, my name will not be included in any assessment collation forms thereby maintaining my confidentiality.

I understand that my participation is voluntary, will not incur any direct benefits to myself and that I may withdraw my participation at any time.

Signature of Subject:
Printed name:

Signature of Researcher:
Printed name:

Date:

APPENDIX F

Table 8. Statistically significant results post Bonferroni Correction

Dominant feeding	0.016	Differences between Black and White samples
Dominant light objects	0.033	Differences between Indian and White samples
Non Dominant feeding	0.006	Differences between Black and Indian samples
	0.029	Differences between Coloured and Indian samples
	0.025	Differences between White and Indian samples

APPENDIX G
Table 9. ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Age	Between Groups	136.225	3	45.408	.383	.765
	Within Groups	13746.100	116	118.501		
	Total	13882.325	119			
Gender	Between Groups	.000	3	.000	.000	1.000
	Within Groups	30.000	116	.259		
	Total	30.000	119			
Dom.	Between Groups	.025	3	.008	.116	.950
	Within Groups	8.300	116	.072		
	Total	8.325	119			
D writing	Between Groups	134.512	3	44.837	1.801	.151
	Within Groups	2887.815	116	24.895		
	Total	3022.327	119			
D page	Between Groups	1.413	3	.471	.321	.810
	Within Groups	170.406	116	1.469		
	Total	171.819	119			
D small	Between Groups	.666	3	.222	.199	.897
	Within Groups	129.723	116	1.118		
	Total	130.389	119			
D feed	Between Groups	11.992	3	3.997	3.692	.014
	Within Groups	125.574	116	1.083		
	Total	137.566	119			
D drau	Between Groups	1.134	3	.378	1.271	.288
	Within Groups	34.493	116	.297		
	Total	35.627	119			
D lite	Between Groups	3.629	3	1.210	2.801	.043
	Within Groups	50.098	116	.432		
	Total	53.727	119			
D heavy	Between Groups	1.927	3	.642	1.647	.182
	Within Groups	45.256	116	.390		
	Total	47.183	119			
ND writ	Between Groups	537.380	3	179.127	1.859	.140
	Within Groups	11174.553	116	96.332		
	Total	11711.932	119			
ND page	Between Groups	5.033	3	1.678	.919	.434
	Within Groups	211.683	116	1.825		
	Total	216.716	119			
ND small	Between Groups	7.232	3	2.411	1.331	.268
	Within Groups	210.078	116	1.811		

	Total	217.309	119			
ND feed	Between Groups	26.821	3	8.940	4.811	.003
	Within Groups	215.554	116	1.858		
	Total	242.375	119			
ND drau	Between Groups	2.278	3	.759	1.930	.129
	Within Groups	45.638	116	.393		
	Total	47.915	119			
ND lite	Between Groups	2.863	3	.954	1.700	.171
	Within Groups	65.125	116	.561		
	Total	67.988	119			
ND heavy	Between Groups	4.083	3	1.361	1.981	.121
	Within Groups	79.700	116	.687		
	Total	83.784	119			

* The mean difference is significant at the .05 level.

APPENDIX H

Table 10 Post Hoc Tests: Bonferroni Correction

Dependent Variable	(I) Ra2e	(J) Ra2e	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Age	1	2	-2.567	2.811	1.000	-10.11	4.98
		3	-2.400	2.811	1.000	-9.94	5.14
		4	-2.400	2.811	1.000	-9.94	5.14
	2	1	2.567	2.811	1.000	-4.98	10.11
		3	.167	2.811	1.000	-7.38	7.71
		4	.167	2.811	1.000	-7.38	7.71
	3	1	2.400	2.811	1.000	-5.14	9.94
		2	-.167	2.811	1.000	-7.71	7.38
		4	.000	2.811	1.000	-7.54	7.54
	4	1	2.400	2.811	1.000	-5.14	9.94
		2	-.167	2.811	1.000	-7.71	7.38
		3	.000	2.811	1.000	-7.54	7.54
Gender	1	2	.000	.131	1.000	-.35	.35
		3	.000	.131	1.000	-.35	.35
		4	.000	.131	1.000	-.35	.35
	2	1	.000	.131	1.000	-.35	.35
		3	.000	.131	1.000	-.35	.35
		4	.000	.131	1.000	-.35	.35
	3	1	.000	.131	1.000	-.35	.35
		2	.000	.131	1.000	-.35	.35
		4	.000	.131	1.000	-.35	.35
	4	1	.000	.131	1.000	-.35	.35
		2	.000	.131	1.000	-.35	.35
		3	.000	.131	1.000	-.35	.35
Dom.	1	2	.000	.069	1.000	-.19	.19
		3	.000	.069	1.000	-.19	.19
		4	.033	.069	1.000	-.15	.22
	2	1	.000	.069	1.000	-.19	.19
		3	.000	.069	1.000	-.19	.19
		4	.033	.069	1.000	-.15	.22
	3	1	.000	.069	1.000	-.19	.19
		2	.000	.069	1.000	-.19	.19
		4	.033	.069	1.000	-.15	.22
	4	1	-.033	.069	1.000	-.22	.15
		2	-.033	.069	1.000	-.22	.15
		3	-.033	.069	1.000	-.22	.15

* The mean difference is significant at the .05 levels.

Dependent Variable	(I) Ra2e	(J) Ra2e	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
D writing	1	2	.89067	1.28828	1.000	-2.5674	4.3487
		3	1.27833	1.28828	1.000	-2.1797	4.7364
		4	2.92133	1.28828	.151	-.5367	6.3794
	2	1	-.89067	1.28828	1.000	-4.3487	2.5674
		3	.38767	1.28828	1.000	-3.0704	3.8457
		4	2.03067	1.28828	.706	-1.4274	5.4887
	3	1	-1.27833	1.28828	1.000	-4.7364	2.1797
		2	-.38767	1.28828	1.000	-3.8457	3.0704
		4	1.64300	1.28828	1.000	-1.8151	5.1011
	4	1	-2.92133	1.28828	.151	-6.3794	.5367
		2	-2.03067	1.28828	.706	-5.4887	1.4274
		3	-1.64300	1.28828	1.000	-5.1011	1.8151
D page	1	2	.2817	.3129	1.000	-.558	1.122
		3	.2120	.3129	1.000	-.628	1.052
		4	.0910	.3129	1.000	-.749	.931
	2	1	-.2817	.3129	1.000	-1.122	.558
		3	-.0697	.3129	1.000	-.910	.770
		4	-.1907	.3129	1.000	-1.031	.649
	3	1	-.2120	.3129	1.000	-1.052	.628
		2	.0697	.3129	1.000	-.770	.910
		4	-.1210	.3129	1.000	-.961	.719
	4	1	-.0910	.3129	1.000	-.931	.749
		2	.1907	.3129	1.000	-.649	1.031
		3	.1210	.3129	1.000	-.719	.961
D small	1	2	.12533	.27304	1.000	-.6076	.8583
		3	.04333	.27304	1.000	-.6896	.7763
		4	.19333	.27304	1.000	-.5396	.9263
	2	1	-.12533	.27304	1.000	-.8583	.6076
		3	-.08200	.27304	1.000	-.8149	.6509
		4	.06800	.27304	1.000	-.6649	.8009
	3	1	-.04333	.27304	1.000	-.7763	.6896
		2	.08200	.27304	1.000	-.6509	.8149
		4	.15000	.27304	1.000	-.5829	.8829
	4	1	-.19333	.27304	1.000	-.9263	.5396
		2	-.06800	.27304	1.000	-.8009	.6649
		3	-.15000	.27304	1.000	-.8829	.5829

Dependent Variable	(I) Ra2e	(J) Ra2e	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
D feed	1	2	-.47567	.26864	.475	-1.1968	.2454
		3	-.70600	.26864	.059	-1.4271	.0151
		4	-.82667(*)	.26864	.016	-1.5478	-.1056
	2	1	.47567	.26864	.475	-.2454	1.1968
		3	-.23033	.26864	1.000	-.9514	.4908
		4	-.35100	.26864	1.000	-1.0721	.3701
	3	1	.70600	.26864	.059	-.0151	1.4271
		2	.23033	.26864	1.000	-.4908	.9514
		4	-.12067	.26864	1.000	-.8418	.6004
	4	1	.82667(*)	.26864	.016	.1056	1.5478
		2	.35100	.26864	1.000	-.3701	1.0721
		3	.12067	.26864	1.000	-.6004	.8418
D drau	1	2	.08300	.14080	1.000	-.2949	.4609
		3	-.15267	.14080	1.000	-.5306	.2253
		4	.08767	.14080	1.000	-.2903	.4656
	2	1	-.08300	.14080	1.000	-.4609	.2949
		3	-.23567	.14080	.581	-.6136	.1423
		4	.00467	.14080	1.000	-.3733	.3826
	3	1	.15267	.14080	1.000	-.2253	.5306
		2	.23567	.14080	.581	-.1423	.6136
		4	.24033	.14080	.543	-.1376	.6183
	4	1	-.08767	.14080	1.000	-.4656	.2903
		2	-.00467	.14080	1.000	-.3826	.3733
		3	-.24033	.14080	.543	-.6183	.1376
D lite	1	2	-.06733	.16968	1.000	-.5228	.3881
		3	-.21767	.16968	1.000	-.6731	.2378
		4	.26300	.16968	.743	-.1925	.7185
	2	1	.06733	.16968	1.000	-.3881	.5228
		3	-.15033	.16968	1.000	-.6058	.3051
		4	.33033	.16968	.324	-.1251	.7858
	3	1	.21767	.16968	1.000	-.2378	.6731
		2	.15033	.16968	1.000	-.3051	.6058
		4	.48067(*)	.16968	.033	.0252	.9361
	4	1	-.26300	.16968	.743	-.7185	.1925
		2	-.33033	.16968	.324	-.7858	.1251
		3	-.48067(*)	.16968	.033	-.9361	-.0252
D heavy	1	2	-.10067	.16127	1.000	-.5336	.3322
		3	-.24767	.16127	.764	-.6806	.1852
		4	.09433	.16127	1.000	-.3386	.5272
	2	1	.10067	.16127	1.000	-.3322	.5336

		3	-.14700	.16127	1.000	-.5799	.2859
		4	.19500	.16127	1.000	-.2379	.6279
	3	1	.24767	.16127	.764	-.1852	.6806
		2	.14700	.16127	1.000	-.2859	.5799
		4	.34200	.16127	.216	-.0909	.7749
	4	1	-.09433	.16127	1.000	-.5272	.3386
		2	-.19500	.16127	1.000	-.6279	.2379
		3	-.34200	.16127	.216	-.7749	.0909

* The mean difference is significant at the .05 levels.

Dependent Variable	(I) Ra2e	(J) Ra2e	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
ND writ	1	2	1.60333	2.53420	1.000	-5.1991	8.4058
		3	-1.66367	2.53420	1.000	-8.4661	5.1388
		4	4.07467	2.53420	.663	-2.7278	10.8771
	2	1	-1.60333	2.53420	1.000	-8.4058	5.1991
		3	-3.26700	2.53420	1.000	-10.0694	3.5354
		4	2.47133	2.53420	1.000	-4.3311	9.2738
	3	1	1.66367	2.53420	1.000	-5.1388	8.4661
		2	3.26700	2.53420	1.000	-3.5354	10.0694
		4	5.73833	2.53420	.152	-1.0641	12.5408
	4	1	-4.07467	2.53420	.663	-10.8771	2.7278
		2	-2.47133	2.53420	1.000	-9.2738	4.3311
		3	-5.73833	2.53420	.152	-12.5408	1.0641
ND page	1	2	.32700	.34879	1.000	-.6093	1.2633
		3	-.01533	.34879	1.000	-.9516	.9209
		4	.45600	.34879	1.000	-.4803	1.3923
	2	1	-.32700	.34879	1.000	-1.2633	.6093
		3	-.34233	.34879	1.000	-1.2786	.5939
		4	.12900	.34879	1.000	-.8073	1.0653
	3	1	.01533	.34879	1.000	-.9209	.9516
		2	.34233	.34879	1.000	-.5939	1.2786
		4	.47133	.34879	1.000	-.4649	1.4076
	4	1	-.45600	.34879	1.000	-1.3923	.4803
		2	-.12900	.34879	1.000	-1.0653	.8073
		3	-.47133	.34879	1.000	-1.4076	.4649
ND small	1	2	.23367	.34747	1.000	-.6990	1.1664
		3	-.08067	.34747	1.000	-1.0134	.8520
		4	.55133	.34747	.692	-.3814	1.4840
	2	1	-.23367	.34747	1.000	-1.1664	.6990
		3	-.31433	.34747	1.000	-1.2470	.6184
		4	.31767	.34747	1.000	-.6150	1.2504
	3	1	.08067	.34747	1.000	-.8520	1.0134
		2	.31433	.34747	1.000	-.6184	1.2470

		4	.63200	.34747	.429	-.3007	1.5647
	4	1	-.55133	.34747	.692	-1.4840	.3814
		2	-.31767	.34747	1.000	-1.2504	.6150
		3	-.63200	.34747	.429	-1.5647	.3007
ND feed	1	2	-.18467	.35197	1.000	-1.1294	.7601
		3	-1.19600(*)	.35197	.006	-2.1408	-.2512
		4	-.16600	.35197	1.000	-1.1108	.7788
	2	1	.18467	.35197	1.000	-.7601	1.1294
		3	-1.01133(*)	.35197	.029	-1.9561	-.0666
		4	.01867	.35197	1.000	-.9261	.9634
	3	1	1.19600(*)	.35197	.006	.2512	2.1408
		2	1.01133(*)	.35197	.029	.0666	1.9561
		4	1.03000(*)	.35197	.025	.0852	1.9748
	4	1	.16600	.35197	1.000	-.7788	1.1108
		2	-.01867	.35197	1.000	-.9634	.9261
		3	-1.03000(*)	.35197	.025	-1.9748	-.0852
ND drau	1	2	.215	.162	1.000	-.22	.65
		3	-.053	.162	1.000	-.49	.38
		4	.272	.162	.574	-.16	.71
	2	1	-.215	.162	1.000	-.65	.22
		3	-.268	.162	.604	-.70	.17
		4	.057	.162	1.000	-.38	.49
	3	1	.053	.162	1.000	-.38	.49
		2	.268	.162	.604	-.17	.70
		4	.325	.162	.283	-.11	.76
	4	1	-.272	.162	.574	-.71	.16
		2	-.057	.162	1.000	-.49	.38
		3	-.325	.162	.283	-.76	.11
ND lite	1	2	-.11900	.19346	1.000	-.6383	.4003
		3	-.41000	.19346	.217	-.9293	.1093
		4	-.08367	.19346	1.000	-.6030	.4356
	2	1	.11900	.19346	1.000	-.4003	.6383
		3	-.29100	.19346	.812	-.8103	.2283
		4	.03533	.19346	1.000	-.4840	.5546
	3	1	.41000	.19346	.217	-.1093	.9293
		2	.29100	.19346	.812	-.2283	.8103
		4	.32633	.19346	.566	-.1930	.8456
	4	1	.08367	.19346	1.000	-.4356	.6030
		2	-.03533	.19346	1.000	-.5546	.4840
		3	-.32633	.19346	.566	-.8456	.1930
ND heavy	1	2	-.04733	.21402	1.000	-.6218	.5272
		3	-.35000	.21402	.628	-.9245	.2245
		4	.15967	.21402	1.000	-.4148	.7342
	2	1	.04733	.21402	1.000	-.5272	.6218
		3	-.30267	.21402	.960	-.8772	.2718
		4	.20700	.21402	1.000	-.3675	.7815
	3	1	.35000	.21402	.628	-.2245	.9245
		2	.30267	.21402	.960	-.2718	.8772

		4	.50967	.21402	.113	-.0648	1.0842
	4	1	-.15967	.21402	1.000	-.7342	.4148
		2	-.20700	.21402	1.000	-.7815	.3675
		3	-.50967	.21402	.113	-1.0842	.0648

* The mean difference is significant at the .05 levels.