The Effects of Relaxation as Measured by Resonant Field Imaging™ and Heart Rate Variability

For Step 3 of the Professional Development Series in Energy Medicine

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This research study uses the **Resonant Field Imaging** (**RFI™**) system combined with the HeartMath Institute's Freeze-Framer biofeedback program to show the effects of stress reduction practice on physiological state.

Purpose

Long-term stresses have a detrimental effect on the physical, mental and emotional bodies. When people learn to take relaxation breaks, built-up stress levels can be reduced. As stress is reduced, the nervous system works more coherently, and as a whole health is more easily maintained. With physical coherence, the two branches of the nervous systems are more balanced, creating synchronization between the heart and the brain, affecting all subsystems of the body. Another name for coherence or synchronization is entrainment. Shifts in entrainment levels reflect the coherence of the physiological autonomic nervous system.

This study measured the heart rate variability and recorded the changes in resonant frequencies at seven areas around the head and heart chakra. As the heart rate variability pattern reduces, the nervous system becomes more balanced and less stressed, and the coherence and entrainment increases. Participants in this study practiced their own relaxation techniques, and the results were recorded both in entrainment ratios and resonant frequency shifts. The results were expected to show that as entrainment ratios went up, the **RFI™** frequencies would become more focused.

Equipment

The Freeze-Framer pulse measurement and software program measures the heart rate variability and plots graphs and charts during data analysis. The Freeze-Framer has been developed by the HeartMath Institute to monitor the physiological changes during stress reduction exercises. Freeze-Frame is a stress reduction exercise that uses the heart to bring the body, mind and emotions into balance. The research participants will be instructed to breathe focusing on their heart during the 6-minute session.

The **RFI™** system, developed by ITEM, employs a hand-held frequency meter with a specially tuned antenna that measures the frequency in Megahertz around the body at various points and distances. It gives a true, real-time reading of the aura frequencies in the natural state at the point of testing. Each frequency can be correlated to one of 15 colors on a frequency chart to assist in looking at Aura colors. The computer software program that accompanies the **RFI™** system takes entered frequencies, prints a color chart of the Aura colors on two levels and chakras, and then prints a complete printout of the meaning of the color in the specific areas.

Features of Measurement Devices

Heart rate variability, as measured by the HeartMath Freeze-Framer device, helps measure mental and emotional balance. The heartbeat rate or pulse is constantly varying. Heart rate variability graphs show the rate of changes in the pulse. The changes are influenced by almost any stimulus to the brain or mind, including emotions, thoughts, sound, light, touch, etc. Doctors use heart rate variability to measure the balance between the sympathetic and parasympathetic nervous system. This is due to the two-way communication between the heart and the brain that regulates heart rate and blood pressure. Entrainment ratio shows the coherence of the nervous system to work efficiently or "in sync." Balance occurs when entrainment levels are in the medium to higher range.

The Entrainment Ratio Bar Chart (Figure 1) is a section of the Freeze-Framer screen that represents the continuously updated graph of the physiological entrainment ratio and heart rate reading during the session. Every five seconds the data is updated in relation to the shifts in the heart rhythm. As the data is recorded, the software program takes the ratio of the averages and adjusts the scores to low entrainment, medium entrainment, or high entrainment. The total of the low, medium and high entrainment scores will always equal 100 percent. The entrainment ratios reflect the average levels of entrainment over the entire length of the ongoing session. The heart rate number displays the average heart rate for last 5-seconds of data. When the session ends, the Entrainment Ratio Bar Chart displays the average entrainment ratio and average heart rate for the entire session.
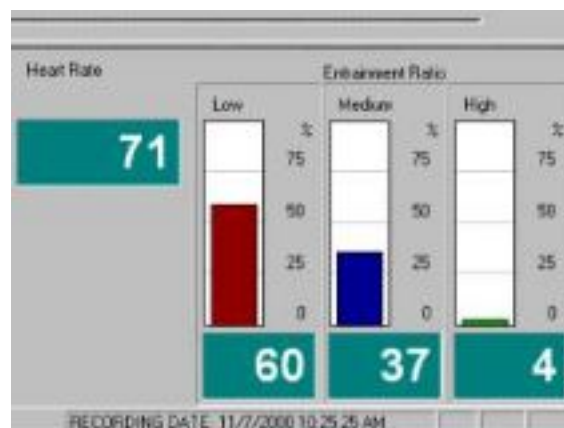
Figure 1 - Entrainment Ratio Bar Chart

RFI™ measures the resonant frequencies of the areas around the body. In this study the six points around the head area, plus the heart chakra, were recorded, first before, and again after, the stress reduction exercise. A shift in the resonant frequencies demonstrate the change in coherence in the physiological body related to the shift in patterns in the cerebral area. The readings taken by the meter do fluctuate, yet in most cases the fluctuation is minimal, and within a small range of numbers. Since the energetic body is a vital living system, the fluctuations are expected. Every reading that is displayed on the frequency meter is a correct reading, so for this study the readings that were most common for each point was recorded.

The regular use of the **RFI™** system correlates colors to the frequencies found around the body. During this study the colors of the frequencies were not a factor, except to the participants who received a color chart and color frequencies of the seven points for their own personal information.

The six points around the head, as shown in Figure 2 below, represent the cerebral area, or the predominant thought area. During the stress reduction exercise, the thought pattern shifts and upon retesting the new frequencies are recorded in the same sequence as before the stress reduction. The first three points relate to the physical head area, while points 4, 5 and 6 relate to the psychological, or mental and emotional body. The physical points are measured 0 to 4 inches from the body, while the psychological points are measured 4 to 18 inches from the body. The heart chakra point was also included since the Heart Math Freeze-Framer program uses the heart energy as its major focus. The seven charkas in the energetic body relate to specific glands of the endocrine system. The heart chakra point is located at number 7 (Figure 2) and was tested at 4 to 8 inches away from the body.

Figure 2 - Points Measured by RFI™

Research Methods

In this study the percentages of the initial and final entrainment ratios were recorded as a measure of the shift in the lower, middle and high entrainment levels, and this percentage was used to correlate to the shift in resonant frequencies measured before and after in the cerebral area. A total of 82 people participated in this study. Each subject was attached to the Freeze-Framer pulse testing on the right index finger. During the first minute of testing, 6 points around the head and the area over the heart chakra were tested. The first reading of the entrainment ratio was recorded and then the **RFI™** practitioner left the client to relax or meditate for 5 minutes. As soon as the tester returned, the entrainment ratio was recorded again, and the 7 points around the body were recorded using the **RFI™** system. The client received a sheet indicating the color of their points before and after, and the recording of the change in the entrainment ratio.

Data Analysis

Data from all 82 participants was used. The data generated in this study is presented in an Excel spreadsheet, available at the end of this report. The readings were compared "Before" relaxation and "After" relaxation. The initial and final entrainment levels were recorded as low, medium and high.

To measure the shifts in entrainment levels, a factor was multiplied to the three levels. This was done to give more value to the higher entrainment ratios. The low entrainment level was multiplied by a factor of one, the medium entrainment level was multiplied by a factor of two, and the high entrainment level was multiplied by a factor of three. By giving more value to the high entrainment level as an indicator of a deeper relaxation state, the shifts in data could be compared. For an example of this factoring the ending data shown in Figure 1 would be read as: 60 x 1 for low entrainment, plus 37 x 2 for medium entrainment, plus 4 x 3 for high entrainment. This equals 146. If the beginning entrainment level was 100% low entrainment, then the entrainment ratio difference would be 46.

The difference between the initial and final **RFI™** readings were compared, along with the averages and standard deviations. Additional comparisons were made looking at averages and standard deviation of the data for entrainment ratio factors over 75, which would indicate more major shifts in stress reduction. This comparison was done to evaluate whether participants who were able to go into a more coherent state during relaxation would have similar **RFI™** frequencies around their cerebral area.

The participants were told to relax or meditate for the 5-minute session, with the suggestion to breathe while focusing on the heart area. Since emotions have an effect, along with mental thought patterns, the changes in the **RFI™** frequency readings can shift depending on the state of mind of the participant. Also with practitioner involvement, like leaving and returning after the 5-minute session, the resonant frequency readings were most likely affected. These factors have not been addressed during this research study.

Results

The data show differences in averages and standard deviation of the seven points before and after relaxation. It also compares differences for those participants who had an entrainment ratio difference greater than 75.

The most measurable results show that the change in standard deviation of the **RFI™** measurements after relaxation was lower than before relaxation. This shows that the aura or resonant frequency becomes more focused during relaxation when the body is more coherent, since the deviation is lower. The average standard deviations for all 82 participants were:

Before relaxation exercise =   51.48 MHz,

After relaxation exercise = 38.48 MHz.

There were 14 participants with an entrainment ratio difference greater than 75. Their average standard deviation was 17.44 MHz, even lower than the overall standard deviation as shown in Figure 3. This lower standard deviation average demonstrates that improved heart rate coherence does bring the **RFI™** frequency averages for the cerebral area closer together, creating an even more organized thought patterns.

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Standard Deviation Comparison
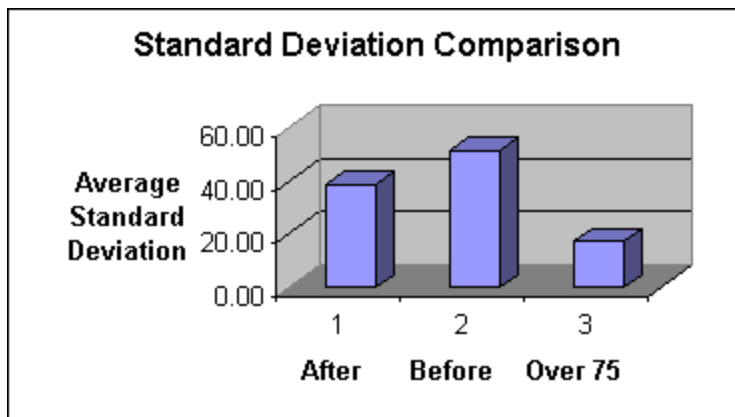
Figure 3 - Standard Deviation Data Results

Conclusion

This research study demonstrated that the standard deviation of the **RFI™** frequencies decreased when the body is in a more relaxed state. When the entrainment ratio increases demonstrating that the body is working more coherently, the resonant frequencies around the cerebral area of the head and heart area are also more focused around a similar number. This verifies that the mental thought patterns become more organized.

Many ideas for future studies using this technology came up during this research. These two measurement devices are accurate and objective enough that many correlations can be made using both devices. The HeartMath Institute's studies have given longer periods relaxation time, which would most likely create additional increases in coherence along with an even more focused resonant frequency.

Bibliography

Freeze Frame - One Minute Stress Management, HeartMath Institute, Planetary Publications, 1998.

Freeze-Framer User's Manual, HeartMath Institute, 1999.

Resonant Field Imaging™ - Technician's Manual for Scientific and Clinical Applications, ITEM, 2004.

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FI Data Sheet

Client #	Place	Before1	Before2	Before3	Before4	Before5	Before6	Before7	After1	After2	After3	After4	After5	After6
1	HA	505	466	455	470	498	523	456	550	454	457	478	517	509
2	HA	622	708	506	681	521	487	304	516	512	461	454	362	470
3	HA	490	478	461	522	486	563	471	675	475	456	505	474	628
4	HA	492	466	473	456	461	463	496	466	464	458	464	454	463
5	Home	295	222	236	165	158	222	230	328	235	238	176	157	258
6	Home	257	211	172	142	171	247	213	219	184	160	113	148	254
7	Home	268	207	109	125	161	308	273	294	205	111	136	158	310
8	Home	328	243	214	175	191	246	233	354	312	221	174	192	348
9	Home	290	218	231	160	153	220	225	320	230	235	172	156	255
10	Home	258	215	175	145	173	250	223	215	183	155	111	152	256
11	Home	263	208	105	122	163	308	275	296	203	115	138	157	321
12	Home	325	245	216	176	195	248	230	355	311	226	184	195	352
13	HA	455	416	405	420	448	473	407	498	404	402	431	472	468
14	HA	572	656	454	631	475	438	358	475	468	423	405	312	422
15	HA	480	438	441	502	468	536	417	457	457	465	515	476	616
16	HA	483	467	474	452	473	456	469	467	446	485	444	445	466
17	HA	486	507	632	514	458	456	452	503	448	476	634	473	481
18	HA	456	489	491	493	546	525	544	476	682	683	470	501	453
19	HA	471	445	594	468	455	530	468	456	463	472	441	450	448
20	HA	476	468	631	505	476	675	515	464	452	452	614	455	481
21	HA	445	613	456	454	454	488	460	461	454	465	474	456	460
22	HA	474	450	506	452	504	689	458	492	453	453	539	508	454
23	HA	476	455	590	452	494	686	450	446	442	458	452	494	472
24	HA	455	454	291	174	451	470	454	461	453	465	465	454	452
25	HA	455	494	456	446	458	454	436	474	541	396	471	455	464
26	HA	452	500	454	452	459	486	204	493	461	453	448	455	472
27	HA	534	462	453	561	462	526	457	466	454	458	545	454	496
28	HA	471	454	469	483	455	470	450	500	454	481	506	454	469
29	HA	461	454	472	655	472	458	458	453	454	454	465	462	465
30	Fair	432	393	382	397	425	450	384	475	381	379	408	449	445
31	Fair	558	642	440	617	461	424	344	461	454	409	391	298	408
32	Fair	449	442	460	543	460	446	446	441	442	442	453	450	453
33	Fair	479	441	434	448	472	502	434	526	435	434	456	491	486
34	Fair	594	661	498	644	506	470	286	497	498	444	437	445	453
35	Fair	484	458	454	448	453	455	478	458	456	451	456	446	455
36	Fair	476	464	447	508	472	549	457	661	461	444	492	460	514
37	Fair	450	426	482	428	480	565	434	468	429	434	513	486	430
38	Fair	465	457	560	494	465	554	514	453	441	441	453	444	470
39	Fair	434	433	275	253	430	449	433	440	432	445	454	434	431
40	Fair	380	334	296	275	295	370	336	342	307	283	263	271	337
41	Fair	418	346	369	285	283	248	353	348	358	363	300	284	383
42	Fair	430	375	371	300	293	355	365	463	362	373	311	292	339
43	Fair	482	497	368	329	345	400	387	408	466	375	382	346	500
44	Fair	352	392	239	209	245	392	357	378	289	195	220	242	394

Client #	Place	Before1	Before2	Before3	Before4	Before5	Before6	Before7	After1	After2	After3	After4	After5	After6
45	Fair	355	312	258	265	275	351	315	312	280	252	280	249	353
46	Fair	454	391	362	323	342	388	372	499	455	370	382	339	469
47	Fair	449	441	604	478	449	608	488	437	425	425	487	428	454
48	Fair	447	423	479	425	477	662	431	465	426	426	512	481	472
49	Fair	426	425	262	145	422	441	425	432	424	437	436	425	432
50	Fair	419	467	421	419	426	453	171	460	428	420	415	422	439
51	Fair	401	569	412	410	410	444	416	417	410	421	430	412	416
52	Fair	450	429	564	426	468	660	424	420	416	432	426	468	446
53	Fair	424	450	415	408	412	410	392	430	497	452	427	431	420
54	Fair	413	408	421	612	431	405	410	405	406	406	417	414	417
55	Fair	443	405	398	412	436	466	398	480	405	396	425	426	452
56	Fair	558	525	462	508	470	434	351	454	462	461	408	312	415
57	Fair	448	434	432	405	426	418	442	422	420	415	420	410	419
58	Fair	440	428	411	472	436	513	421	605	445	417	454	432	478
59	Fair	414	390	446	392	444	429	398	432	393	383	379	454	394
60	Fair	429	421	484	458	429	454	478	417	405	405	417	408	434
61	HA	458	451	479	552	469	455	455	450	451	451	462	459	462
62	HA	538	476	475	565	466	530	461	470	458	462	556	458	500
63	HA	479	453	449	443	448	450	473	453	451	454	451	442	456
64	HA	458	497	459	449	461	475	439	377	544	405	472	458	476
65	HA	457	505	459	457	446	491	409	498	466	458	453	460	475
66	HA	496	470	477	460	465	467	500	470	468	462	486	458	476
67	HA	461	460	397	480	457	476	454	467	459	471	471	460	458
68	HA	477	453	409	455	498	592	461	495	456	456	542	511	457
69	HA	508	496	486	473	501	462	459	553	457	460	481	520	512
70	HA	484	457	454	517	483	554	467	565	473	451	505	471	621
71	HA	514	502	499	575	514	480	297	509	505	454	447	355	463
72	HA	528	456	447	455	456	520	451	460	448	452	514	448	490
73	HA	460	493	495	497	550	529	548	480	568	587	447	505	457
74	HA	456	524	467	465	456	499	471	472	465	476	485	467	471
75	HA	490	511	636	518	462	460	456	507	452	480	538	487	485
76	HA	465	458	486	459	476	462	462	457	458	458	469	466	469
77	HA	467	551	449	524	470	433	353	470	463	418	400	307	417
78	HA	484	424	445	512	475	540	421	551	461	469	519	480	520
79	HA	540	455	426	387	403	458	445	566	524	433	486	404	480
80	HA	510	437	451	380	373	437	445	543	450	453	491	472	473
81	HA	579	567	550	513	575	551	560	564	564	545	594	563	617
82	HA	550	481	490	421	415	482	487	508	491	498	432	415	527

Client #	After7	Before-Low	Before-Med	Before-High	After-Low	After-Med	After-High	Entrain Dif	After-Before1	After-Before2	After-Before3	After-Before4	After-Before5
1	471	100			85	15		15	45	-12	2	8	19
2	469		100		11	53	36	25	-106	-196	-45	-227	-159
3	483	50	50		19	56	25	56	185	-3	-5	-17	-12
4	476	50	50		11	43	46	85	-26	-2	-15	8	-7
5	114	100			87	13		13	33	13	2	11	-1
6	112	100			91	9		9	-38	-27	-12	-29	-23
7	272	100			86	10	4	18	26	-2	2	11	-3
8	269	100			75	25		25	26	69	7	-1	1
9	118	100			84	16		16	30	12	4	12	3
10	115	100			92	8		8	-43	-32	-20	-34	-21
11	275	100			85	15		15	33	-5	10	16	-6
12	275	100			80	12	8	28	30	66	10	8	0
13	425	100			83	17		17	43	-12	-3	11	24
14	418	50	50		15	52	33	68	-97	-188	-31	-226	-163
15	475	50	50		13	46	41	78	-23	19	24	13	8
16	467	100			11	54	35	124	-16	-21	11	-8	-28
17	449		50	50	15	66	19	-46	17	-59	-156	120	15
18	570	100			96	4		4	20	193	192	-23	-45
19	448	100			43	58		59	-15	18	-122	-27	-5
20	444	100			77	23		23	-12	-16	-179	109	-21
21	461		100		27	62	11	-16	16	-159	9	20	2
22	481	100			83	17		17	18	3	-53	87	4
23	445	100			81	16	3	22	-30	-13	-132	0	0
24	454		100		6	21	73	67	6	-1	174	291	3
25	454	100			34	41	23	85	19	47	-60	25	-3
26	237	100				19	81	181	41	-39	-1	-4	-4
27	464		100		9	88	2	-9	-68	-8	5	-16	-8
28	538	100			58	30	12	54	29	0	12	23	-1
29	463	100			57	41	2	45	-8	0	-18	-190	-10
30	402	100			93	7		7	43	-12	-3	11	24
31	404	100			91	9		9	-97	-188	-31	-226	-163
32	451	100			11	54	35	124	-8	0	-18	-90	-10
33	448	100			64	24	12	48	47	-6	0	8	19
34	452	100			96	4		4	-97	-163	-54	-207	-61
35	468	100			43	58		59	-26	-2	-3	8	-7
36	468	100			77	23		23	185	-3	-3	-16	-12
37	457	100			58	33	9	51	18	3	-48	85	6
38	433	100			83	17		17	-12	-16	-119	-41	-21
39	433	100			81	16	3	22	6	-1	170	201	4
40	235	100			86	14		14	-38	-27	-13	-12	-24
41	246	100			34	41	23	85	-70	12	-6	15	1
42	249	100				19	81	181	33	-13	2	11	-1
43	423	100			87	13		13	-74	-31	7	53	1
44	356	100			58	30	12	54	26	-103	-44	11	-3

Client #	After7	Before-Low	Before-Med	Before-High	After-Low	After-Med	After-High	Entrain Dif	After-Before1	After-Before2	After-Before3	After-Before4	After-Befo
45	321	100			57	41	2	45	-43	-32	-6	15	-26
46	419	100			83	17		17	45	64	8	59	-3
47	417	100			33	53	4	51	-12	-16	-179	9	-21
48	454	100			31	45	24	93	18	3	-53	87	4
49	425	100				23	77	177	6	-1	175	291	3
50	204	100			94	6		6	41	-39	-1	-4	-4
51	417	100			68	25	7	39	16	-159	9	20	2
52	419	100			54	46		46	-30	-13	-132	0	0
53	440	100			88	12		12	6	47	37	19	19
54	415	100			95	5		5	-8	-2	-15	-195	-17
55	412	100			16	64	10	74	37	0	-2	13	-10
56	416	100			42	58		58	-104	-63	-1	-100	-158
57	432	100			94	6		6	-26	-14	-17	15	-16
58	432	100			92	8		8	165	17	6	-18	-4
59	421	100			75	25		25	18	3	-63	-13	10
60	397	100			83	17		17	-12	-16	-79	-41	-21
61	460	100			82	18		18	-8	0	-28	-90	-10
62	468	100			83	15	2	19	-68	-18	-13	-9	-8
63	463	50	50		4	33	63	109	-26	-2	5	8	-6
64	457	100			36	45	29	113	-81	47	-54	23	-3
65	424	100			81	19		19	41	-39	-1	-4	14
66	480		100			88	12	12	-26	-2	-15	26	-7
67	460	100			68	28	4	36	6	-1	74	-9	3
68	484	100			55	39	6	51	18	3	47	87	13
69	474		100		6	21	73	67	45	-39	-26	8	19
70	478		50	50	8	44	47	-13	81	16	-3	-12	-12
71	462		100		12	75	2	-32	-5	3	-45	-128	-159
72	458	100			53	36	9	52	-68	-8	5	59	-8
73	574		100		9	88	2	-9	20	75	92	-50	-45
74	472		100		8	25	67	59	16	-59	9	20	11
75	453	50	50		12	56	32	70	17	-59	-156	20	25
76	467	100			55	38	7	52	-8	0	-28	10	-10
77	413	50	50		15	49	39	80	3	-88	-31	-124	-163
78	479		100		17	52	11	-46	67	37	24	7	5
79	481		50	50	15	66	19	-46	26	69	7	99	1
80	429		100		27	62	11	-16	33	13	2	111	99
81	572	50	50		15	52	33	68	-15	-3	-5	81	-12
82	482	50	50		13	46	41	78	-42	10	8	11	0
								Averages=	3.76	-7.00	-11.71	7.92	-13.03

Client #	After-Before6	After-Before7	AvgDifference	AfterStDev	BeforeStDev	Difference	>75Diff	AfterAvg	BeforeAvg	After-BeforeAvg	>75AvgDif
1	-14	15	8.86	37.72	26.68	-11.04		494.17	481.86	12.31	
2	-17	165	-104.71	55.76	138.15	82.39		462.50	547.00	-84.50	
3	65	12	21.14	92.42	35.30	-57.13		535.50	495.86	39.64	
4	0	-20	-6.00	4.55	15.65	11.10	8.77	461.50	472.43	-10.93	-8.86
5	36	-116	8.29	61.15	46.26	-14.90		232.00	218.29	13.71	
6	7	-101	-18.43	50.84	42.25	-8.59		179.67	201.86	-22.19	
7	2	-1	4.86	83.32	78.23	-5.09		202.33	207.29	-4.95	
8	102	36	14.57	80.68	49.64	-31.04		266.83	232.86	33.98	
9	35	-107	8.71	59.27	46.32	-12.95		228.00	213.86	14.14	
10	6	-108	-21.43	51.32	42.39	-8.93		178.67	205.57	-26.90	
11	13	0	6.86	85.60	79.08	-6.52		205.00	206.29	-1.29	
12	104	45	16.29	78.21	48.00	-30.22		270.50	233.57	36.93	
13	-5	18	9.00	39.47	26.52	-12.95		445.83	432.00	13.83	
14	-16	60	-100.71	58.64	109.87	51.22		417.50	512.00	-94.50	
15	80	58	5.86	61.88	41.13	-20.76	-16.01	497.67	468.86	28.81	25.57
16	10	-2	-8.86	16.61	10.70	-5.90	-4.77	458.83	467.71	-8.88	-7.71
17	25	-3	-9.00	66.78	63.07	-3.71		502.50	500.71	1.79	
18	-72	26	48.14	108.25	33.13	-75.12		544.17	506.29	37.88	
19	-82	-20	-21.57	11.17	53.22	42.05		455.00	490.14	-35.14	
20	-194	-71	-17.00	63.51	83.23	19.73		486.33	535.14	-48.81	
21	-28	1	-16.00	7.17	59.57	52.40		461.67	481.43	-19.76	
22	-235	23	8.43	36.01	84.52	48.51		483.17	504.71	-21.55	
23	-214	-5	-25.00	19.42	90.02	70.60		460.67	514.71	-54.05	
24	-18	0	67.57	6.06	114.71	108.65	108.94	458.33	392.71	65.62	65
25	10	18	4.00	46.34	18.01	-28.33	-24.57	466.83	457.00	9.83	8
26	-14	33	-1.00	16.56	101.24	84.68		463.67	429.57	34.10	
27	-30	7	-13.57	36.07	45.11	9.04		478.83	493.57	-14.74	
28	-1	88	9.00	22.39	11.87	-10.52		477.33	464.57	12.76	
29	7	5	-32.29	5.78	73.10	67.32		458.83	490.00	-31.17	
30	-5	18	9.00	39.47	26.52	-12.95		422.83	409.00	13.83	
31	-16	60	-100.71	58.64	109.87	51.22		403.50	498.00	-94.50	
32	7	5	-18.00	5.78	35.66	29.88	30.16	446.83	463.71	-16.88	-16.29
33	-16	14	9.71	36.16	26.18	-9.99		471.33	458.57	12.76	
34	-17	166	-83.14	27.71	128.20	100.49		462.33	522.71	-60.38	
35	0	-10	-4.29	4.41	13.81	9.39		453.67	461.43	-7.76	
36	-35	11	21.57	80.33	35.30	-45.04		505.33	481.86	23.48	
37	-135	23	9.14	34.89	49.29	14.40		460.00	466.43	-6.43	
38	-84	-81	-29.86	11.09	42.89	31.79		450.33	501.29	-50.95	
39	-18	0	54.29	8.94	84.29	75.36		439.33	386.71	52.62	
40	-33	-101	-16.29	33.70	39.74	6.04		300.50	326.57	-26.07	
41	135	-107	-6.86	38.73	59.16	20.43	8.2	339.33	328.86	10.48	-1.43
42	-16	-116	4.57	60.30	46.99	-13.31	-21.47	356.67	355.57	1.10	-14.29
43	100	36	-6.29	58.82	65.04	6.23		412.83	401.14	11.69	
44	2	-1	-16.14	83.32	78.37	-4.95		286.33	312.29	-25.95	

Client #	After-Before6	After-Before7	AvgDifference	AfterStDev	BeforeStDev	Difference	>75Diff	AfterAvg	BeforeAvg	After-BeforeAvg	>75AvgDif
45	2	6	-13.14	39.36	39.73	0.37		287.67	304.43	-16.76	
46	81	47	24.71	63.82	42.09	-21.73		419.00	376.00	43.00	
47	-154	-71	-31.29	24.35	72.74	48.39		442.67	502.43	-59.76	
48	-190	23	8.43	33.30	84.52	51.22	53.9	463.67	477.71	-14.05	-15.43
49	-9	0	67.71	5.44	114.71	109.26	109.25	431.00	363.71	67.29	66.43
50	-14	33	-1.00	16.56	101.24	84.68		430.67	396.57	34.10	
51	-28	1	-16.00	7.17	59.57	52.40		417.67	437.43	-19.76	
52	-214	-5	-25.00	19.42	90.02	70.60		434.67	488.71	-54.05	
53	10	48	18.29	28.62	17.86	-10.76		442.83	415.86	26.98	
54	12	5	-33.86	5.78	75.11	69.33		410.83	442.86	-32.02	
55	-14	14	5.43	30.99	26.18	-4.82		430.67	422.57	8.10	
56	-19	65	-60.86	57.31	67.93	10.62		418.67	472.57	-53.90	
57	1	-10	-8.29	4.41	14.55	10.13		417.67	429.29	-11.62	
58	-35	11	23.71	68.41	35.30	-33.12		471.83	445.86	25.98	
59	-35	23	-6.43	30.17	23.92	-6.25		405.83	416.14	-10.31	
60	-20	-81	-24.14	11.09	24.97	13.88		414.33	450.43	-36.10	
61	7	5	-19.43	5.78	35.69	29.91		455.83	474.14	-18.31	
62	-30	7	-16.57	38.66	41.69	3.04		484.00	501.57	-17.57	
63	6	-10	-3.00	4.88	13.81	8.93	7.5	451.17	456.43	-5.26	7.5
64	1	18	-9.71	58.73	18.78	-39.95	-34.83	455.33	462.57	-7.24	-7
65	-16	15	1.57	16.38	31.09	14.71		468.33	460.57	7.76	
66	9	-20	-3.43	10.04	15.65	5.61		470.00	476.43	-6.43	
67	-18	6	10.43	6.06	27.37	21.32		464.33	455.00	9.33	
68	-135	23	24.00	36.01	57.16	21.15		486.17	477.86	8.31	
69	50	15	1.00	37.72	19.33	-18.39		497.17	483.57	13.60	
70	67	11	10.00	65.77	36.05	-29.73		514.33	488.00	26.33	
71	-17	165	-47.71	55.76	87.19	31.43		455.50	483.00	-27.50	
72	-30	7	-2.86	27.27	34.87	7.60		468.67	473.29	-4.62	
73	-72	26	13.14	58.23	33.13	-25.09		507.33	510.29	-2.95	
74	-28	1	-0.43	7.17	25.35	18.17		472.67	476.86	-4.19	
75	25	-3	-21.86	28.84	63.07	34.23		491.50	504.71	-13.21	
76	7	5	-5.14	5.78	10.33	4.56		462.83	466.86	-4.02	
77	-16	60	-57.57	58.64	64.19	5.55	10.66	412.50	463.86	-51.36	-51.29
78	-20	58	20.00	35.34	44.74	9.40		500.00	471.57	28.43	
79	22	36	28.86	58.86	49.64	-9.23		482.17	444.86	37.31	
80	36	-16	36.86	34.15	46.26	12.10		480.33	433.29	47.05	
81	66	12	6.57	26.11	22.12	-3.99		574.50	556.43	18.07	
82	45	-5	-1.86	44.62	45.82	1.20	6.89	478.50	475.14	3.36	2.43
	-17.55	13.82	-2.86	30.71	45.10	14.39	25.56	454.55	456.29	-1.74	0.44