Appendix D. Ethical Principles of the APA

Preamble

Psychologists respect the dignity and worth of the individual and strive for the preservation and protection of fundamental human rights. They are committed to increasing knowledge of human behavior and of people's understanding of them- selves and others and to the utilization of such knowledge for the promotion of human welfare. While pursuing these objectives, they make every effort to protect the welfare of those who seek their services and of the research participants that may be the object of study. They use their skills only for purposes consistent with these values and do not knowingly permit their misuse by others. While demanding for themselves freedom of inquiry and communication, psychologists accept the responsibility this freedom requires: competence, objectivity in the application of skills, and Concern for the best interests of clients, colleagues, students, research participants and society. In the pursuit of these ideals, psychologists subscribe to principles in the following areas: 1. Responsibility, 2. Competence, 3. Moral and Legal Standards, 4. Public Statements, 5. Confidentiality, 6. Welfare of the Consumer, 7. Professional Relationships, 8. Assessment Techniques, 9. Research with Human Participants, and 10. Care and Use of Animals.

Acceptance of membership in the American Psychological Association commits the member to adherence to these principles.

Psychologists cooperate with duly constituted committees of the American Psychological Association, in particular, the Committee on Scientific and Professional Ethics and Conduct, by responding to inquiries promptly and completely. Members also respond promptly and completely to inquiries from duly constituted state association ethics committees and professional standards review committees.

Principle 1: Responsibility

In providing services, psychologists maintain the highest standards of their profession. They accept responsibility for the consequences of their acts and make every effort to ensure that their services are used appropriately.

Principle 2: Competence

The maintenance of high standards of competence is a responsibility shared by all psychologists in the interest of the public and the profession as a whole. Psychologists recognize the boundaries of their competence and the limitations of their techniques. They only provide services and only use techniques for which they are qualified by training and experience. In those areas in which recognized standards do not yet exist, psychologists take whatever precautions are necessary to protect the welfare of their clients. They maintain knowledge of current scientific and professional information related to the services they render.

Principle 3: Moral and Legal Standards

Psychologists' moral and ethical standards of behavior are a personal matter to the same degree as they are for any other citizen, except as these may compromise the fulfillment of their professional responsibilities or reduce the public trust in psychology and psychologists. Regarding their own behavior, psychologists are sensitive to prevailing community standards and to the possible impact that conformity to or deviation from these standards may have upon the quality of their performance as psychologists. Psychologists are also aware of the possible impact of their public behavior upon the ability of colleagues to perform their professional duties.

Principle 4: Public Statements

Public statements, announcements of services, advertising, and promotional activities of psychologists serve the purpose of helping the public make informed judgments and choices. Psychologists represent accurately and objectively their professional qualifications, affiliations. and functions, as well as those of the institutions or organizations with which they or the statements may be associated. In public statements providing psychological information or professional opinions or providing information about the availability of psychological products, publications, and services, psychologists base their statements on scientifically acceptable psychological findings and techniques with full recognition of the limits and uncertainties of such evidence.

Principle 5. Confidentiality

Psychologists have a primary obligation to respect the confidentiality of information obtained from persons in the course of their work as psychologists. They reveal such information to others only with the consent of the person or the person's legal representative, except in those unusual circumstances in which not to do so would result in clear danger to the person or to others. Where appropriate, psychologists inform their clients of the legal limits of confidentiality.

Principle 6: Welfare of the Consumer

Psychologists respect the integrity and protect the welfare of the people and groups with whom they work. When conflicts of interest arise between clients and psychologists' employing institutions, psychologists clarify the nature and direction of their loyalties and responsibilities and keep all parties informed of their commitments. Psychologists fully inform consumers as to the purpose and nature of an evaluative, treatment, educational, or training procedure, and they freely acknowledge that clients, students, or participants in research have freedom of choice with regard to participation.

Principle 7: Professional Relationships

Psychologists act with due regard for the needs, special competencies, and obligations of their colleagues in psychology and other professions. They respect the prerogatives and obligations of the institutions or organizations with which these other colleagues are associated.

Principal 8: Assessment Techniques

In the development, publication and utilization of psychological assessment techniques, psychologists make every effort to promote the welfare and best interests of the client. They guard against the misuse of assessment results. They respect the client's right to know the results. the interpretations made, and the bases for their conclusions and recommendations. Psychologists make every effort to maintain the security of tests and other assessment techniques within limits of legal mandates. They strive to ensure the appropriate use of assessment techniques by others.

Principle 9: Research with Human Participants

The decision to undertake research rests upon a considered judgment by the individual psychologist about how best to contribute to psychological science and human welfare. Having made the decision to conduct research, the psychologist considers alternative directions in which research energies and resources might be invested. On the basis of this consideration, the psychologist carries out the investigation with respect and concern for the dignity and welfare of the people who participate and with cognizance of federal and state regulation and professional standards governing the conduct of research with human participants.

Principle 10. Care and Use of Animals

An investigator of animal behavior strives to advance understanding of basic behavioral principles and/or to contribute to the improvement of human health and welfare. In seeking these ends, the investigator ensures the welfare of animals and treats them humanely. Laws and regulations notwithstanding, an animal's immediate protection depends upon the scientist's own conscience.

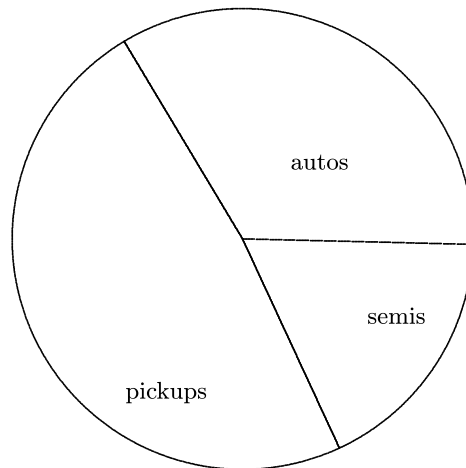Copyright 1990 by the American Psychological Association.

Appendix E. Solutions

I. Descriptive Statistic: Percentiles

1.
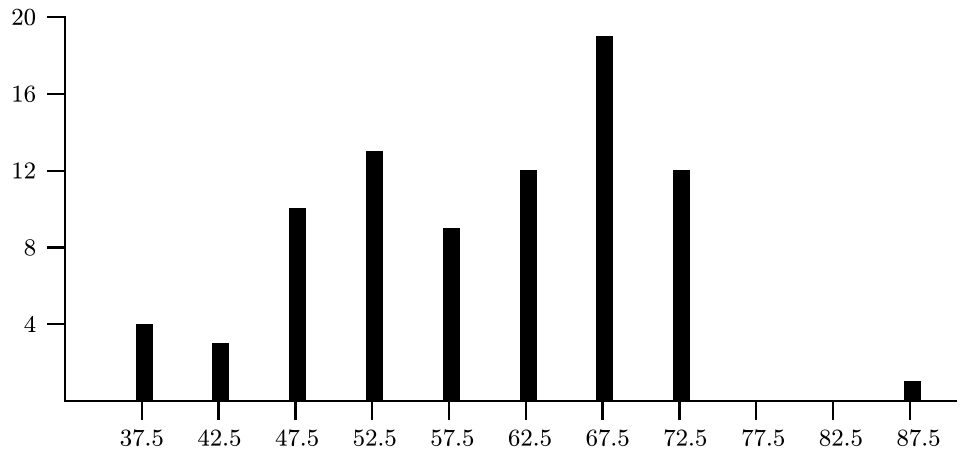
2.

The slice for the ambulance is only four degrees wide and is too narrow to show on this pie graph.

3.
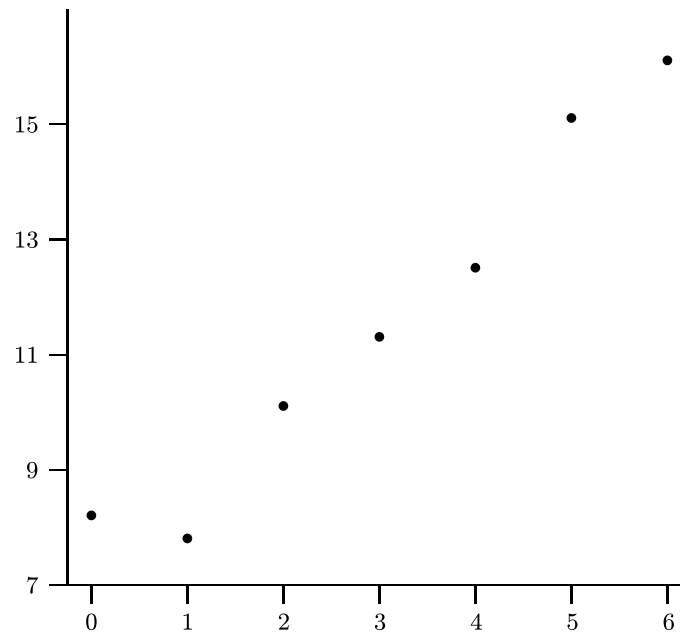
II. Descriptive Statistics: Means and Variances

1. The mean is 518.167 and the standard deviation is 88.223.

2. The mean is 586.375 and the standard deviation is 35.426.

3. The mean is 7.148 and the standard deviation is 2.910.

IV. Normal Tables

1. The z-score is 0.4 and the corresponding percentile is 65.54.

2. The z-score is 1.6 and the corresponding percentile is 94.52.

3. The z-score is 0.67 and the corresponding observation is 567.

4. The z-score is -2.375 and the corresponding percentile is 0.86.

5. The z-score is -0.67 and the corresponding observation is 89.95.

6. The z-score is -0.43 and the corresponding observation is 17.85.

7. The z-score is 3.2 and the corresponding percentile is 100.

8. The z-score is -1.33 and the corresponding percentile is 9.17.

V. Confidence intervals for Means

1. The `ERROR` is 0.813 and the confidence interval is 31.19 to 32.81.

2. The `ERROR` is 1.97 and the confidence interval is 30.03 to 33.97.

3. The `ERROR` is 3.08 and the confidence interval is 64.92 to 71.08.

4. The `ERROR` is 2 and the confidence interval is 56.90 to 60.90.

5. The `ERROR` is 0.318 and the confidence interval is 5.782 to 6.418.

VI. Confidence Intervals for Proportions

1. The `ERROR` is 6.54% and the confidence interval is 21.35% to 34.42%.

2. The `ERROR` is 4.62% and the confidence interval is 23.26% to 32.51%.

3. The `ERROR` is 2.71% and the confidence interval is 38.13% to 43.54%.

4. The `ERROR` is 1.42% and the confidence interval is 4.59% to 7.43%.

5. The `ERROR` is 1.66% and the confidence interval is 13.37% to 16.69%.

VII. Tests for Means: One Sample Problems

1. The value of the test statistic is 1.776; the cutoff is 1.644. You therefore *reject* the null hypothesis.

2. The value of the test statistic is 2.057; the cutoff is 1.644. You therefore *reject* the null hypothesis.

3. The value of the test statistic is -1.46; the cutoff is -1.881. You therefore *accept* the null hypothesis.

4. The value of the test statistic is 1.689; the cutoff is 1.751. You therefore *accept* the null hypothesis.

5. The value of the test statistic is -2.367; the cutoff is -1.751. You therefore *reject* the null hypothesis.

VIII. Tests for Means: Two Sample Problems

1. The value of the test statistic is -2.06; the cutoff is -1.75. You therefore *reject* the null hypothesis.

2. The value of the test statistic is 1.79; the cutoff is 1.64. You therefore *reject* the null hypothesis.

3. The value of the test statistic is 4.92; the cutoff is 2.33. You therefore *reject* the null hypothesis.

4. The value of the test statistic is 1.71; the cutoff is 1.75. You therefore *accept* the null hypothesis.

5. The value of the test statistic is -1.99; the cutoff is -2.33. You therefore *accept* the null hypothesis.

IX. Analysis of Variance

1. The ANOVA table is

V_T	190.44	199
V_C	7.25	3
V_R	183.19	196

The value of the F statistic is $F = 2.586$ and the value of the cutoff is 2.6507. This means that you *accept* the null hypothesis that the means are all the same.

2. The ANOVA table is

V_T	49	99
V_C	10.16	4
V_R	39.84	95

The value of the F statistic is $F = 7.847$ and the value of the cutoff is 2.447. This means that you *reject* the null hypothesis that the means are all the same.

3. The ANOVA table is

V_T	5776	71
V_C	476.81	2
V_R	5299.19	69

The value of the F statistic is $F = 3.104$ and the value of the cutoff is 3.1296. This means that you *accept* the null hypothesis that the means are all the same.

4.

(i) The ANOVA table is

V_T	676	399
V_C	16.19	3
V_R	659.81	396

The value of the F statistic is $F = 3.328$ and the value of the cutoff is 3.316. This means that you *accept* the null hypothesis that the means are all the same.

(ii) The ANOVA table is

V_T	176.89	299
V_C	4.222	2
V_R	172.678	297

The value of the F statistic is $F = 3.3631$ and the value of the cutoff is 3.964. This means that you *accept* the null hypothesis that the means are all the same.

5. The ANOVA table is

V_T	243.98	149
V_C	10.667	2
V_R	233.318	147

The value of the F statistic is $F = 3.360$ and the value of the cutoff is 3.058. This means that you *reject* the null hypothesis that the means are all the same.

X. Tests for Proportions: One Sample Problems

1. The value of the test statistic is 12.36; the cutoff is 1.644. You therefore*reject* the null hypothesis.

2. The value of the test statistic is 0.737; the cutoff is 1.644. You therefore*accept* the null hypothesis.

3. The value of the test statistic is 1.648; the cutoff is 1.644. You therefore*reject* the null hypothesis.

4. The value of the test statistic is 1.84; the cutoff is 1.644. You therefore*reject* the null hypothesis.

5. The value of the test statistic is 8.52; the cutoff is 2.326. You therefore*reject* the null hypothesis.

XI. Correlations

1.

$\bar{x}$	5
s_x	1.414
$\bar{y}$	4
s_y	2.280

The correlation coeficient is 0.682.

2.

proportion men	0.538
mean observation	71.154

The correlation coeficient is -0.254.

XII. Tests for Correlation Coeeficients

1. The test statistic has value -0.871; the cutoff is ± 1.96. This means that you accept the null hypothesis that the correlation is really zero.

2. The test statistic has value -7.72; the cutoff is± 1.96. This means that you reject the null hypothesis that the correlation is really zero.

3. The test statistic has value 12.808; the cutoff is ± 1.96. This means that you reject the null hypothesis that the correlation is really zero.

4. The test statistic has value 1.675; the cutoff is ± 1.96. This means that you accept the null hypothesis that the correlation is really zero.

XIII. Linear Regression

1. The regression equation is
$$y = 0.00358x + 1.1785$$
and so the computed value of y is 2.909.

2. The regression equation is
$$y = -0.8125x + 130.25$$
and so the computed value of y is 84.75.

3. The regression equation is
$$y = 1.8x + -41.74$$
and so the computed value of y is -0.34.

4. Since you are trying to predict first year grades, y must be *grades*. Since you will be using *ACT scores* to do the prediction, these must be x. The regression equation is
$$y = 0.0886x + -0.011$$
and so the computed value of y is 1.938.

5. Since you are trying to predict the *child's* IQ, this must be y. You will be using the *Mother's* IQ to do the prediction, so this must be x. The regression equation is
$$y = 0.93057x + 12.151$$
and so the computed value of y is 112.65.

XIV. One Way Tables

1. The value of the test statistic is 4.939; the cutoff is 7.815. This means that you accept the null hypothesis.

2. The value of the test statistic is 8.011; the cutoff is 9.210. This means that you accept the null hypothesis.

3. The value of the test statistic is 4.196; the cutoff is 11.345. This means that you accept the null hypothesis.

XV. Two Way Tables

1. The value of the test statistic is 12.874; the cutoff is 12.59. This means that you reject the null hypothesis.

2. The value of the test statistic is 6.112; the cutoff is 5.99. This means that you reject the null hypothesis.

3. The value of the test statistic is 4.464; the cutoff is 3.84. This means that you reject the null hypothesis.

Appendix F.01 (One Percent F Tables)

	1	2	3	4	5	6	7	8	9	10	15	30	100	1000
1	4052.18	4999.50	5403.35	5624.58	5763.65	5858.99	5928.36	5981.07	6022.47	6055.85	6157.28	6260.65	6334.11	6362.68
2	98.503	99.000	99.166	99.249	99.299	99.333	99.356	99.374	99.388	99.399	99.433	99.466	99.489	99.498
3	34.1162	30.8165	29.4567	28.7099	28.2371	27.9107	27.6717	27.4892	27.3452	27.2287	26.8722	26.5045	26.2402	26.1367
4	21.1977	18.0000	16.6944	15.9770	15.5219	15.2069	14.9758	14.7989	14.6591	14.5459	14.1982	13.8377	13.5770	13.4745
5	16.2582	13.2739	12.0600	11.3919	10.9670	10.6723	10.4555	10.2893	10.1578	10.0510	9.7222	9.3793	9.1299	9.0314
6	13.7450	10.9248	9.7795	9.1483	8.7459	8.4661	8.2600	8.1017	7.9761	7.8741	7.5590	7.2285	6.9867	6.8908
7	12.2464	9.5466	8.4513	7.8466	7.4604	7.1914	6.9928	6.8400	6.7188	6.6201	6.3143	5.9920	5.7547	5.6601
8	11.2586	8.6491	7.5910	7.0061	6.6318	6.3707	6.1776	6.0289	5.9106	5.8143	5.5151	5.1981	4.9633	4.8694
9	10.5614	8.0215	6.9919	6.4221	6.0569	5.8018	5.6129	5.4671	5.3511	5.2565	4.9621	4.6486	4.4150	4.3211
10	10.0443	7.5594	6.5523	5.9943	5.6363	5.3858	5.2001	5.0567	4.9424	4.8491	4.5581	4.2469	4.0137	3.9196
11	9.6460	7.2057	6.2167	5.6683	5.3160	5.0692	4.8861	4.7445	4.6315	4.5393	4.2509	3.9411	3.7077	3.6131
12	9.3302	6.9266	5.9525	5.4120	5.0643	4.8206	4.6395	4.4994	4.3875	4.2961	4.0096	3.7008	3.4668	3.3716
13	9.0738	6.7010	5.7394	5.2053	4.8616	4.6204	4.4410	4.3021	4.1911	4.1003	3.8154	3.5070	3.2723	3.1763
14	8.8616	6.5149	5.5639	5.0354	4.6950	4.4558	4.2779	4.1399	4.0297	3.9394	3.6557	3.3476	3.1118	3.0150
15	8.6831	6.3589	5.4170	4.8932	4.5556	4.3183	4.1415	4.0045	3.8948	3.8049	3.5222	3.2141	2.9772	2.8795
16	8.5310	6.2262	5.2922	4.7726	4.4374	4.2016	4.0259	3.8896	3.7804	3.6909	3.4089	3.1007	2.8627	2.7641
17	8.3997	6.1121	5.1850	4.6690	4.3359	4.1015	3.9267	3.7910	3.6822	3.5931	3.3117	3.0032	2.7639	2.6644
18	8.2854	6.0129	5.0919	4.5790	4.2479	4.0146	3.8406	3.7054	3.5971	3.5082	3.2273	2.9185	2.6779	2.5775
19	8.1849	5.9259	5.0103	4.5003	4.1708	3.9386	3.7653	3.6305	3.5225	3.4338	3.1533	2.8442	2.6023	2.5009
20	8.0960	5.8489	4.9382	4.4307	4.1027	3.8714	3.6987	3.5644	3.4567	3.3682	3.0880	2.7785	2.5353	2.4329
21	8.0166	5.7804	4.8740	4.3688	4.0421	3.8117	3.6396	3.5056	3.3981	3.3098	3.0300	2.7200	2.4755	2.3722
22	7.9454	5.7190	4.8166	4.3134	3.9880	3.7583	3.5867	3.4530	3.3458	3.2576	2.9779	2.6675	2.4217	2.3175
23	7.8811	5.6637	4.7649	4.2636	3.9392	3.7102	3.5390	3.4057	3.2986	3.2106	2.9311	2.6202	2.3732	2.2680
24	7.8229	5.6136	4.7181	4.2184	3.8951	3.6667	3.4959	3.3629	3.2560	3.1681	2.8887	2.5773	2.3291	2.2230
25	7.7698	5.5680	4.6755	4.1774	3.8550	3.6272	3.4568	3.3239	3.2172	3.1294	2.8502	2.5383	2.2888	2.1818
26	7.7213	5.5263	4.6366	4.1400	3.8183	3.5911	3.4210	3.2884	3.1818	3.0941	2.8150	2.5026	2.2519	2.1440
27	7.6767	5.4881	4.6009	4.1056	3.7848	3.5580	3.3882	3.2558	3.1494	3.0618	2.7827	2.4699	2.2180	2.1092
28	7.6356	5.4529	4.5681	4.0740	3.7539	3.5276	3.3581	3.2259	3.1195	3.0320	2.7530	2.4397	2.1867	2.0769
29	7.5977	5.4204	4.5378	4.0449	3.7254	3.4995	3.3303	3.1982	3.0920	3.0045	2.7256	2.4118	2.1577	2.0471
30	7.5625	5.3903	4.5097	4.0179	3.6990	3.4735	3.3045	3.1726	3.0665	2.9791	2.7002	2.3860	2.1307	2.0192
31	7.5298	5.3624	4.4837	3.9928	3.6745	3.4493	3.2806	3.1489	3.0428	2.9555	2.6766	2.3619	2.1056	1.9933
32	7.4993	5.3363	4.4594	3.9695	3.6517	3.4269	3.2583	3.1267	3.0208	2.9335	2.6546	2.3395	2.0821	1.9690
33	7.4708	5.3120	4.4368	3.9477	3.6305	3.4059	3.2376	3.1061	3.0003	2.9130	2.6341	2.3186	2.0602	1.9462
34	7.4441	5.2893	4.4156	3.9273	3.6106	3.3863	3.2182	3.0868	2.9810	2.8938	2.6150	2.2990	2.0396	1.9248
35	7.4191	5.2679	4.3957	3.9082	3.5919	3.3679	3.2000	3.0687	2.9630	2.8758	2.5970	2.2806	2.0202	1.9046
36	7.3956	5.2479	4.3771	3.8903	3.5744	3.3507	3.1829	3.0517	2.9461	2.8589	2.5801	2.2633	2.0019	1.8855
37	7.3734	5.2290	4.3595	3.8734	3.5579	3.3344	3.1668	3.0357	2.9302	2.8431	2.5642	2.2470	1.9847	1.8675
38	7.3525	5.2112	4.3430	3.8575	3.5424	3.3191	3.1516	3.0207	2.9151	2.8281	2.5492	2.2317	1.9684	1.8505
39	7.3328	5.1944	4.3274	3.8425	3.5277	3.3047	3.1373	3.0064	2.9010	2.8139	2.5350	2.2171	1.9530	1.8343
40	7.3141	5.1785	4.3126	3.8283	3.5138	3.2910	3.1238	2.9930	2.8876	2.8005	2.5216	2.2034	1.9383	1.8189
41	7.2964	5.1634	4.2986	3.8148	3.5007	3.2781	3.1109	2.9802	2.8749	2.7879	2.5089	2.1903	1.9244	1.8042
42	7.2796	5.1491	4.2853	3.8021	3.4882	3.2658	3.0988	2.9681	2.8628	2.7758	2.4969	2.1780	1.9112	1.7903
43	7.2636	5.1356	4.2726	3.7899	3.4764	3.2541	3.0872	2.9567	2.8514	2.7644	2.4854	2.1662	1.8986	1.7770
44	7.2484	5.1226	4.2606	3.7784	3.4651	3.2430	3.0762	2.9457	2.8405	2.7536	2.4746	2.1550	1.8866	1.7643
45	7.2339	5.1103	4.2492	3.7674	3.4544	3.2325	3.0658	2.9353	2.8301	2.7432	2.4642	2.1443	1.8751	1.7521