

INTERDEPARTMENTAL CORRESPONDENCE

FROM K. A. Jones

DATE June 13, 1984

TO W. L. Davies

RETENTION LIMIT 6/85

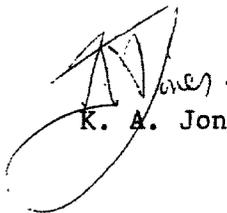
SUBJECT

ATTENTION
G.I. SYMPTOM MAPPING RESEARCH: PD # 1083-53

Attached is a detailed summary of the above national study. This consumer research is of value to us in the following ways/areas:

1. Nervous Stomach: This research shows nervous stomach and upset stomach are viewed as interchangeable descriptions in terms of the symptom cluster experienced by consumers. This data will provide strong support for our proposed approach to FDA to obtain nervous stomach as a label indication. This label indication could be achieved potentially on a relatively fast timing if the OTC Exclusivity Policy is approved by the FDA this year.
2. Acid Indigestion vs Indigestion: These two symptoms are considered to be virtually indistinguishable from each other in the eyes of the consumer. The cluster analysis and perceptual mapping further supports this assessment. Further this data will help us provide a basis with the FDA for maintaining indigestion labeling i.e. this consumer research allows us to develop a consumer definition for indigestion.
3. Female vs Male Symptomology: This consumer research once again (ref: MRD 80251) shows that females have a higher frequency of certain types of symptoms than males e.g. nausea, and that this difference is probably traceable to differences in male vs female biology.

In net, this consumer research has provided us with very useful insights into the consumers perception of the stomach remedy area. We will share these findings with the Advertising Brand group.



K. A. Jones

cc: M. Collar/G. Meyerman
M. Mobley
T. Hill
M. Crisanti
A. Shumaker

INTERDEPARTMENTAL CORRESPONDENCE

FROM K. Charak DATE May 16, 1984
TO K. A. Jones RETENTION LIMIT 7/1/85
SUBJECT SUMMARY OF GI SYMPTOM MAPPING RESEARCH: PD #1083-53 ATTENTION

This summarizes Sections I and II of PD #1083-53 the objectives of which were to develop a comprehensive consumer-based understanding of common gastrointestinal symptoms, the perceived causes of these symptoms and the products used to treat them.

Background

The primary objective of this study was to develop a solid base of consumer habits and practices information dealing with the condition of nervous stomach. Nervous stomach is the single most important, unmet consumer need and represents a major business building opportunity for the Pepto-Bismol brand. This objective was met and is summarized in a separate memo by M. Crisanti (memo 3/22/84, Section III).

Sections I and II were added to this study to further broaden our knowledge of gastrointestinal symptoms, causes and treatments. In Section I, consumers were asked to rate the similarity/difference of 18 common gastrointestinal

symptoms on a 7 point scale (Table 1). The symptoms studied included: heartburn, acid indigestion, sour stomach, nausea/queasiness, burping/-belching, passing gas, diarrhea, nervous stomach, indigestion, upset stomach, vomiting, constipation, increased desire to eat, stomach ache, head ache, fullness, abdominal cramps and loss of appetite. Each symptom was paired with every other symptom (153 pairs total). It is important to note that the information collected in this portion of the study represents consumer association of one symptom vs. the other. The association may or may not be based on personal experience with the individual symptoms.

In Section II, consumers were asked (a) which of these 18 symptoms they personally experienced, (b) what they think caused the symptom, and (c) what medicines (OTC and prescription) they used to treat them.

The similarity/difference data generated in Section I were analyzed two different ways. First, a cluster analysis was conducted to determine unique groupings of symptoms. Secondly, multi-dimensional scaling techniques were utilized to provide a global 3 dimensional map of how consumers view each symptom relevant to all others.

This study was conducted by Market Facts, Inc. Questionnaires were mailed to a nationally representative sample of 250 males and 225 females. A total of 310 usable questionnaires were returned and subjected to statistical analysis.

Key Findings

- (1) The basic test methodology used in this study was successful in defining perceptual similarity/difference relationships between symptoms. Panelists used the full spectrum of the grading scale which provided good resolution between individual symptoms.

<u>Symptom Pair</u>	<u>Pair Score</u>	<u>Interpretation</u>
Acid indigestion/indigestion	1.56	Symptoms are extremely similar
Vomiting/increased desire to eat	5.78	Symptoms are completely different

- (2) Upset stomach and nervous stomach are perceived by consumers as being very similar, (pair score: 2.25). Additional support for this can be found in the cluster analysis presented in Figure 1 and the perceptual mapping plots given in Figures 2 and 3. In Figure 1, upset stomach and nervous stomach are clustered together along with stomachache and sour stomach in the so-called "stomach" cluster. In Figure 2, upset stomach and nervous stomach are plotted very close to each other in 3-dimensional space (particularly for females).

Pair scores for upset stomach and nervous stomach compared with all the other symptoms, not surprisingly, are quite similar. There are, however, a few differences that should be noted. Sour stomach, vomiting and nausea are more associated with upset stomach than nervous stomach (Table 2). An analysis of the basic etiologic factor further distinguishes upset stomach from nervous stomach. An upset stomach is caused, to a large extent, by food indiscretions and illness, whereas, a nervous stomach is caused by stressful situations (Table 3).

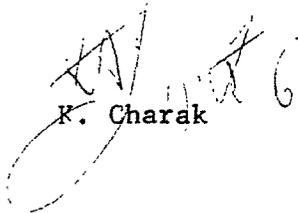
- (3) The symptoms of acid indigestion and indigestion are virtually indistinguishable from each other in the eyes of the consumer (pair score: 1.56). The cluster analysis (Figure 1) and perceptual mapping plots (Figures 2, 3) further support the high degree of similarity between these two terms. The pair score profiles for these two symptoms are very similar with the exception of sour stomach. Sour stomach appears to be much more associated with acid indigestion than indigestion (Table 4).
- (4) Overall, males and females tend to view the various gastrointestinal symptoms relative to each other similarly. This is illustrated

clearly in the cluster profiles in Figure 1. There are, however, some important differences between the two sexes that should be noted.

- (a) Females generally experience more gastrointestinal discomforts than males, most notably with respect to nervous stomach, increased desire to eat, loss of appetite, abdominal cramps and constipation (Table 5).
 - (b) Females, in general, are more vulnerable to gastrointestinal upsets associated with stress than males. This is shown clearly when one examines the symptoms of upset stomach, nervous stomach, nausea and diarrhea secondary to a stressful situation (Table 6).
 - (c) Females associate abdominal cramps and diarrhea with stomach distress to a much greater extent than males. This is illustrated in the cluster analysis (Figure 1) noting that the AB/DI cluster is nested within the stomach distress cluster in females and is displaced in males. This relationship makes sense since females generally experience more diarrhea than males and because of cramping associated with the menstrual cycle itself.
- (5) The three primary causes of most gastrointestinal problems are food, illness and stress. Menstruation is another important cause of GI distress being linked directly to abdominal cramps, diarrhea, nausea, headache, stomachache, fullness, loss of appetite and increased desire to eat (Table 7). Pepto-Bismol's role for treating the symptoms associated with menstruation should be investigated.
- (6) Consumers believe that common colds and respiratory viruses, in much the same manner as an intestinal bug, can cause gastrointestinal symptoms (Table 8). This is an interesting perception since from strictly a scientific standpoint, respiration-borne viruses do not cause GI distress. It may be that respiratory viruses lower overall body resistance which increases one's vulnerability to intestinal pathogens. This is somewhat of a controversial topic in the medical literature.
- (7) The key brand usage data gathered in this study are as follows (Table 9):
- (a) Antacids as a class of drugs clearly dominate the stomach remedy market. They are used quite extensively to treat a wide range of upper GI symptoms including upset stomach, nausea, indigestion, heartburn, nervous stomach and even vomiting. Major brands include Maalox/Mylanta (liquid), Roloids/Tums (tablets) and Alka-Seltzer (effervescent).
 - (b) Pepto-Bismol, as expected, gets a lot of brand mentions for its 4 major label indications: upset stomach (51%), nausea (35%), indigestion (30%) and diarrhea (47%). Brand mentions for heart-

burn, however, drop appreciably (13%) indicating consumers just don't associate Pepto-Bismol usage with heartburn even though they clearly make this association with indigestion. Current copy executions which focus on "heartburn" are clearly on target and should increase usage considerably at the expense of the antacids.

- (c) Pepto-Bismol, as expected, gets a lot of brand mentions for diarrhea (47%) as does Kaopectate, its principal competitor (43%). While we've frequently said Pepto-Bismol has 50% share of the antidiarrheal market, in reality, Pepto-Bismol's share may actually be less when one considers (a) the other antidiarrheal products available and (b) Kaopectate's recommended dose is 2-4 times greater than Pepto's. If this proves to be the case, then the growth potential in the antidiarrheal market is much greater than we've previously estimated.
- (d) Pepto-Bismol gets a reasonable amount of mentions for nervous stomach (17%) even though our advertising has never focussed on this use. Current copy executions that focus on stress/heartburn should help increase usage for nervous stomach.
- (e) Pepto-Bismol is the number one brand for vomiting (31%) even though the brand is not promoted for this indication. The likely explanation for this is the clear consumer association of nausea with vomiting.


K. Charak

1s3/KC-19

cc T. Y. Hill
N. H. Allen
A. C. Shumaker

TABLE 1

SCALE

- 0 - They are exactly the same.
- 1 - They are so similar, I can't tell them apart.
- 2 - They are very similar, but I think I can tell them apart.
- 3 - They are similar but I know I can tell them apart.
- 4 - They are different, but they still have a lot in common
(i.e., I often associate one with the other).
- 5 - They are very different, and have little in common
(i.e., I rarely associate one with the other).
- 6 - They are completely different, and have almost nothing in common
(i.e., I never associate one with the other).

TABLE 2

Upset Stomach/Nervous Stomach Similarity/Difference Scores

	<u>Upset Stomach</u>	<u>Nervous Stomach</u>
Upset Stomach	----	2.25
Nervous Stomach	2.25	----
Indigestion	2.84	3.04
Nausea	2.28	2.83
Acid Indigestion	2.69	3.17
Heartburn	3.94	3.81
Diarrhea	3.83	4.13
Burp	3.45	3.81
Constipation	4.59	4.95
Fullness	4.22	4.68
Headache	4.98	5.05
Increased Desire to Eat	5.59	5.08
Loss of Appetite	3.67	3.40
Passing Gas	3.85	3.84
Stomachache	2.93	2.78
Sour Stomach	2.04	2.82
Vomiting	2.59	3.68
Abdominal Cramps	3.38	3.75

TABLE 3

PERCEIVED CAUSES OF UPSET STOMACH AND NERVOUS STOMACH (% Mentions)

	<u>Upset Stomach</u>	<u>Nervous Stomach</u>
Overindulgence - Food	45	7
Overindulgence - Alcohol	27	6
Food that Disagreed	63	12
Intestinal Bug	51	3
Common Cold	21	7
Pressure - Work	19	33
Personal Problems	28	46
General Life Stress	28	40

TABLE 4

Acid Indigestion/Indigestion Similarity/Difference Scores

	<u>Indigestion</u>	<u>Acid Indigestion</u>
Indigestion	---	1.56
Acid Indigestion	1.56	---
Upset Stomach	2.85	2.71
Nervous Stomach	3.04	3.17
Nausea	3.60	3.57
Heartburn	2.25	1.94
Diarrhea	5.07	4.89
Burp	2.52	2.98
Constipation	5.00	5.12
Fullness	3.72	3.94
Headache	5.17	5.28
Increased Desire to Eat	5.53	5.55
Loss of Appetite	4.42	4.62
Passing Gas	3.95	4.18
Stomachache	3.07	3.40
Sour Stomach	2.71	1.99
Vomiting	4.16	4.44
Abdominal Cramps	4.09	4.38

TABLE 5

Symptoms Experienced vs. Sex (% Mentions)

	<u>Male</u>	<u>Female</u>
Nervous Stomach	64.6	78.5
Upset Stomach	95.2	95.7
Indigestion	83.6	87.1
Diarrhea	91.8	95.1
Passing Gas	90.5	93.2
Burp/Belch	89.8	88.3
Nausea	87.1	87.1
Acid Indigestion .	72.8	71.8
Heartburn	72.1	72.4
Loss of Appetite	61.9	78.5
Abdominal Cramps	74.1	94.5
Sour Stomach	74.1	75.4
Fullness	79.5	87.7
Headache	90.4	95.1
Stomachache	89.8	92.0
Increased Desire to Eat	55.8	74.2
Constipation	67.3	79.1
Vomiting	84.3	91.4

TABLE 6

Perceived Causes of Stress by Symptom (% Mentions)

<u>Symptom</u>	<u>Perceived Causes</u>		
	<u>Personal Problems</u>	<u>General Life Stress</u>	<u>Work Pressure</u>
Upset Stomach			
Male	20	22	18
Female	36	33	19
Nervous Stomach			
Male	31	36	33
Female	60	42	32
Nausea			
Male	14	13	11
Female	25	17	12
Diarrhea			
Male	7	7	5
Female	20	18	6

TABLE 7

Symptoms Associated with Menstruation

	<u>% Mentions</u>
Abdominal Cramps	66
Diarrhea	16
Nausea	16
Upset Stomach	20
Stomachache	21
Fullness	17
Loss of Appetite	14
Increased Desire to Eat	16
Headache	32

TABLE 8

Symptoms Associated With Illness (% Mentions)

	<u>Common Cold/ Respiratory Virus</u>	<u>24-Hour Bug/ Intestinal Virus</u>
Upset Stomach	20	51
Diarrhea	21	62
Nausea	23	50
Loss of Appetite	36	43
Headache	44	37
Stomachache	15	42
Abdominal Cramps	8	39
Vomiting	16	61

TABLE 9

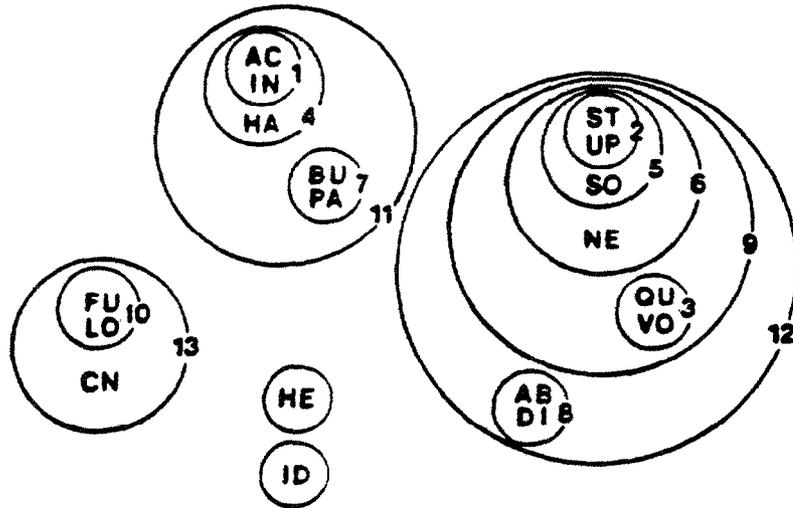
PRODUCTS USED TO TREAT SYMPTOMS (% Mentions)

	<u>Upset Stomach</u>	<u>Nausea</u>	<u>Indigestion</u>	<u>Heartburn</u>	<u>Diarrhea</u>	<u>Nervous Stomach</u>	<u>Vomiting</u>
Pepto-Bismol Liquid	39	26	21	9	35	13	24
Pepto-Bismol Tablets	12	9	9	4	12	4	7
Maalox	29	13	28	27	3	14	12
Mylanta	16	7	16	13	2	9	5
Rolaids	20	8	27	26	1	8	2
Tums	19	6	23	25	0	7	2
Alka-Seltzer	29	17	26	17	1	9	11
Kaopectate	11	3	2	1	43	1	6
Donnagel	3	2	0	1	6	2	3
Rheaban	1	0	1	0	2	1	1
Parepectolin	1	1	1	0	4	1	2
Other Antidiarrheals	0	0	0	0	4	0	0
Emetrol	2	3	0	0	1	0	4

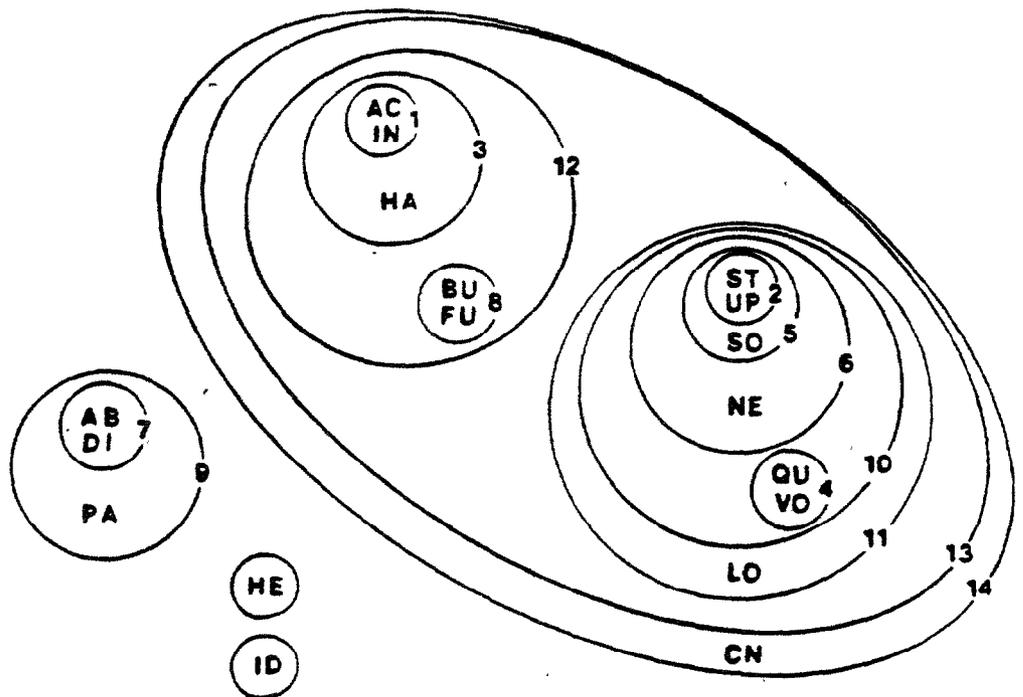
Figure 1

CLUSTER ANALYSIS - SIMILAR/DIFFERENCE MEANS DATA

FEMALE PANELISTS



MALE PANELISTS



Clustering is an algorithm which finds the two stimuli closest to each other first, combines them and calculates their center. The algorithm then treats that pair as a single item and proceeds to repeat the process.

There is no significance test for the clustering process. The cut-off point is a judgement decision based on an interpretation of the clusters.

In the graphic presentation of the cluster analyses above, the numerals indicate sequential steps in the proces

DEFINITION OF NERVOUS STOMACH STUDY

3-dimensional Mapping Solution - Female Panelists

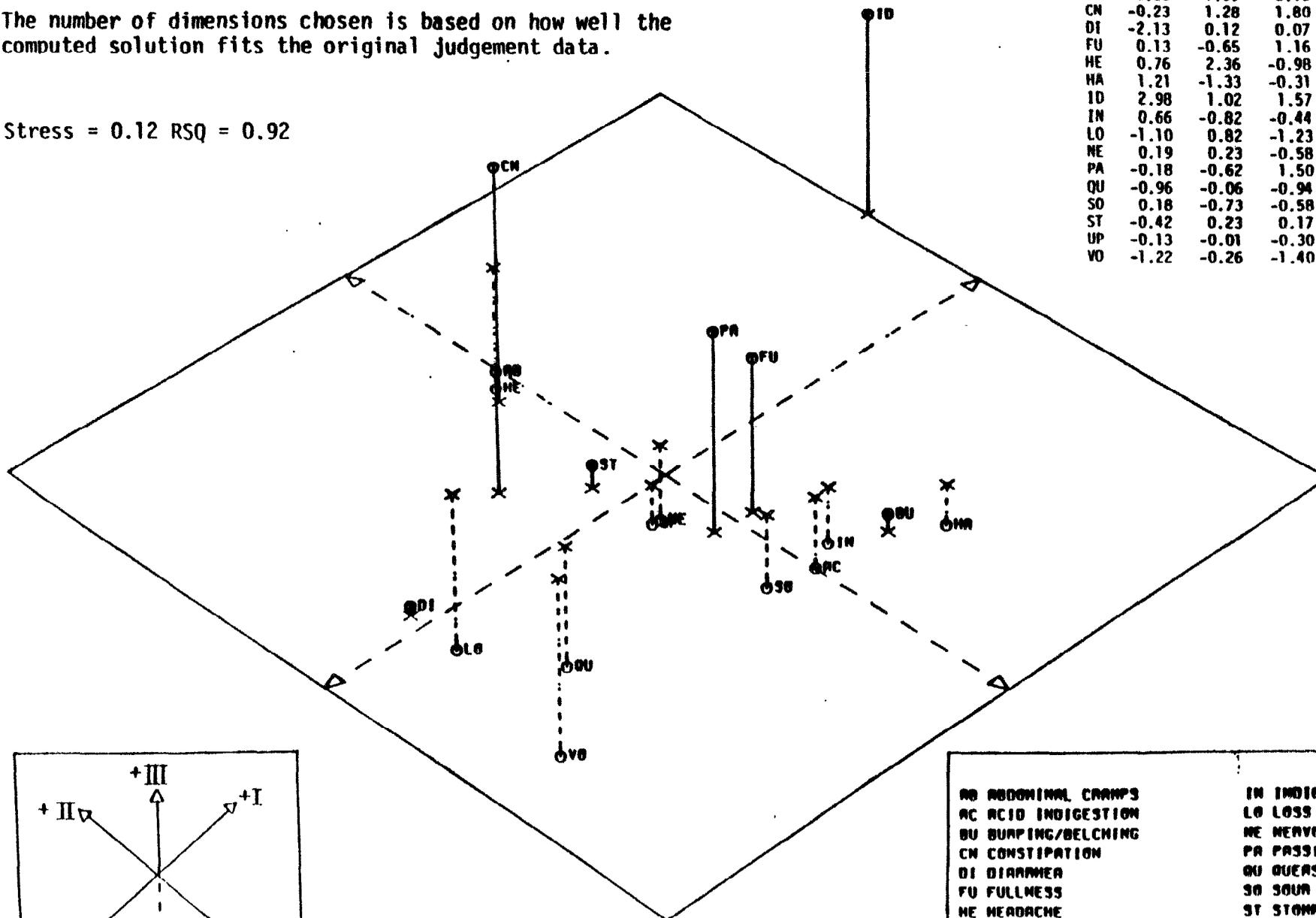
Multi-dimensional scaling is a computer algorithm which finds locations in euclidean space for the stimuli, such that, the distance between stimuli best agrees with the similarity/dis-similarity judgements.

The number of dimensions chosen is based on how well the computed solution fits the original judgement data.

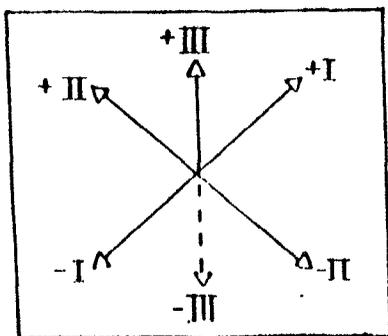
Stress = 0.12 RSQ = 0.92

Coordinates

	I	II	III
AB	-0.88	0.62	0.91
AC	0.53	-0.82	-0.56
BU	0.60	-1.39	0.13
CN	-0.23	1.28	1.80
DI	-2.13	0.12	0.07
FU	0.13	-0.65	1.16
HE	0.76	2.36	-0.98
HA	1.21	-1.33	-0.31
ID	2.98	1.02	1.57
IN	0.66	-0.82	-0.44
LO	-1.10	0.82	-1.23
NE	0.19	0.23	-0.58
PA	-0.18	-0.62	1.50
QU	-0.96	-0.06	-0.94
SO	0.18	-0.73	-0.58
ST	-0.42	0.23	0.17
UP	-0.13	-0.01	-0.30
VO	-1.22	-0.26	-1.40



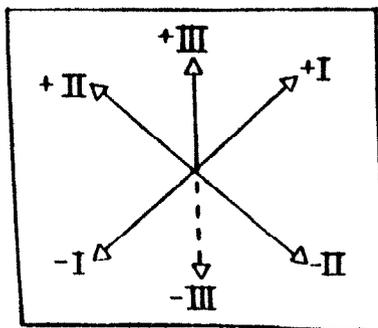
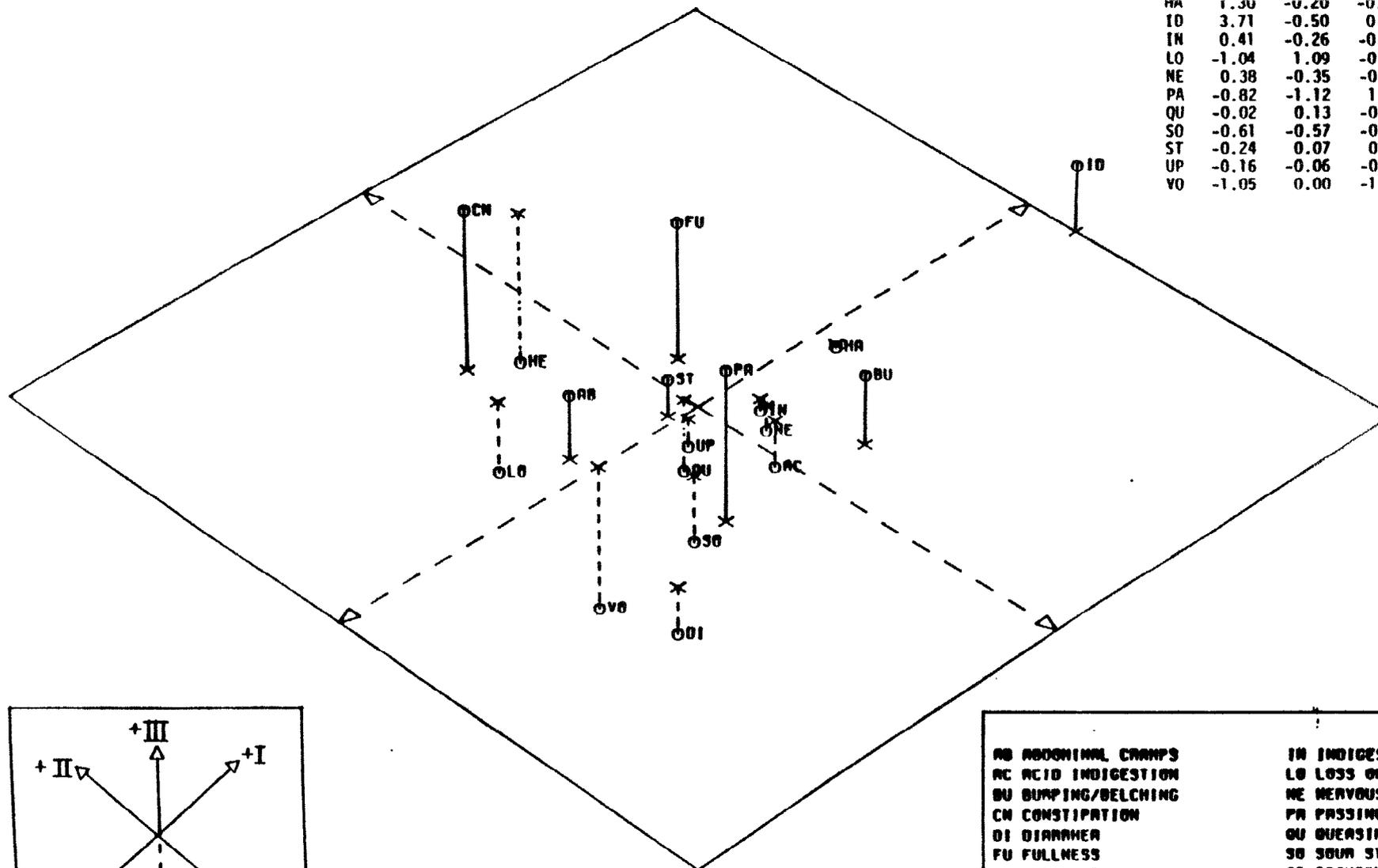
AB	ABDOMINAL CRAMPS	IN	INDIGESTION
AC	ACID INDIGESTION	LO	LOSS OF APPETITE
BU	BURPING/BELCHING	NE	NERVOUS STOMACH
CN	CONSTIPATION	PA	PASSING GAS
DI	DIARRHEA	QU	QUEASINESS/NAUSEA
FU	FULLNESS	SO	SOUL STOMACH
HE	HEADACHE	ST	STOMACHACHE
HA	HEARTBURN	UP	UPSET STOMACH
ID	INCREASED DESIRE TO EAT	VO	VOMITING



COMPUTER DEFINITION OF NERVOUS STOMACH SYMPTOM
 3-Dimensional Mapping Solution - Male Panelists

Stress = 0.12 RSQ = 0.93

	Coordinates		
	I	II	III
AB	-1.14	0.21	0.58
AC	0.30	-0.53	-0.44
BU	0.58	-1.19	0.63
CN	-0.95	1.52	1.44
DI	-1.63	-1.42	-0.43
FU	0.30	0.51	1.24
HE	0.70	2.68	-1.41
HA	1.30	-0.20	-0.03
ID	3.71	-0.50	0.63
IN	0.41	-0.26	-0.11
LO	-1.04	1.09	-0.66
NE	0.38	-0.35	-0.23
PA	-0.82	-1.12	1.36
QU	-0.02	0.13	-0.67
SO	-0.61	-0.57	-0.62
ST	-0.24	0.07	0.33
UP	-0.16	-0.06	-0.26
VO	-1.05	0.00	-1.34



- | | |
|----------------------------|----------------------|
| AB ABDOMINAL CRAMPS | IN INDIGESTION |
| AC ACID INDIGESTION | LO LOSS OF APPETITE |
| BU BUMPING/BELCHING | NE NERVOUS STOMACH |
| CN CONSTIPATION | PA PASSING GAS |
| DI DIARRHEA | QU QUEASINESS/NAUSEA |
| FU FULLNESS | SO SOUR STOMACH |
| HE HEADACHE | ST STOMACHACHE |
| HA HEARTBURN | UP UPSET STOMACH |
| ID INCREASED DESIRE TO EAT | VO VOMITING |