

End-User Perceptions of Formal and Informal Representations of Web Sites

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ABSTRACT

Web site designers have expressed concern that formal, cleaned-up representations of early web site ideas cause end-users to focus on inappropriate visual details such as color and typography during a design evaluation. It is believed that the high level of detail in formal representations causes end-users to believe a design is more complete and therefore not amenable to more conceptual non-visual changes such as page structure and site organization. In this paper we present an experiment comparing end-user perceptions of formal and informal electronic representations of web site designs. We found that end-users do in fact believe formal representations are more finished and unchanging, but that this does not seem to influence their choice of design changes. It appears that the type of media used to present informal designs and the type of evaluation performed by the end-user may affect those results.

Keywords

Web design, sketching, informal, formal, prototyping

INTRODUCTION

One study of web site designers discovered that sketching on paper is especially important during the design exploration phases of a web site [4]. The usefulness of sketching in early stages of design has also been documented in the case of GUIs [2, 5, 6]. Sketches are inherently ambiguous, which allows the designer to focus on basic structural issues instead of unimportant details [1].

In many cases, designers expressed concern over how formal representations of early, unfinished ideas often caused viewers to focus on inappropriate details. Many designers reported that clients and even other designers tend to focus on details like color and typography when presented with a set of high-fidelity mock-ups and have trouble focusing on the larger concepts [2]. During the early stages of design, this kind of feedback is not as useful as high-level comments about the overall design.

Furthermore, designers have remarked that people perceive a cleaned-up design as less likely to change in the future, discouraging certain lines of discussion. On the other hand, designers have anecdotally noted that formal

representations are perceived as more professional than quickly sketched out informal designs.

In this paper, we discuss an experiment we ran to investigate these claims. Specifically, we have two hypotheses. The first is that there is a perceived difference in how professional, how finished, how functional, and how likely to change the two representations seem. The second is that people will rank the importance of visual and non-visual issues differently between the two cases. To test these hypotheses, we ran a task-based usability evaluation of two web site designs using both formal and informal representations.

EXPERIMENT DESIGN

Our independent variables were the formality of the representation of the web site, either formal or informal. Our dependent variables measured people's overall perception of the web site and how important they believed low-level visual changes were versus high-level changes.

We ran a 2x2 experiment with 16 participants, using formal and informal representations of two actual e-commerce web sites, peggyli.com (web site A) and casadefruta.com (web site B). Each person tested a formal web site representation of one web site, and an informal representation of the other. The ordering of formal or informal and of web site A or B was randomized.

Within-subjects				
Between-subjects		Formal	Informal	Total
	Web Site A	4	4	8
	Web Site B	4	4	8
	Total	8	8	16

Table 1. Participants tested formal and informal representations of web sites in one of two conditions. The ordering of formal and informal was randomized.

The formal representations were obtained by downloading local copies of the two web sites. Since these were finished web sites, parts of the formal representations were greeked so that they would not have a completed feel to them (See Figures 1 and 3 for screen shots of the two web sites). These web sites did not have dynamic content other than a shopping cart, which lists the items customers are

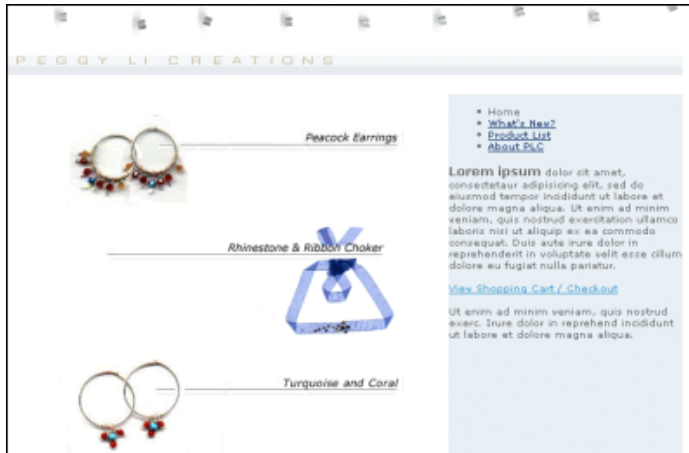


Figure 1. A formal representation of peggyli.com, web site A.

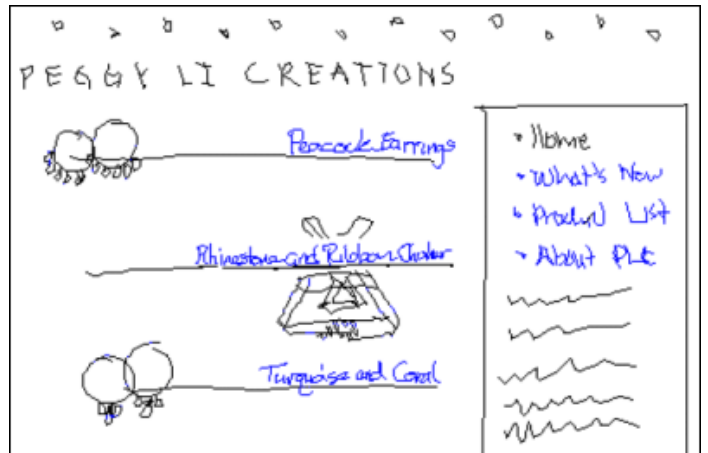


Figure 2. An informal representation of web site A.



Figure 3. A formal representation of Casa de Fruta, web site B.



Figure 4. An informal representation of web site B.

considering purchasing. We mocked up the shopping cart pages by hardwiring the data to be correct for the experimental tasks, although there were cases where participants could run into pages with inconsistent data due to the static nature of our copy.

We also created informal mockups of these same portions using DENIM [3], a sketch-based web site design tool (see Figure 5). We made sketches of the two web sites, using scribbles to represent significant portions of text and making rough copies of the pictures. We then used DENIM's "Export to HTML" feature, which generates GIF images and HTML image maps of the sketches, allowing standard web browsers to view and interact with the pages drawn in DENIM.

However, much of the handwritten text was difficult to read, due to the awkwardness of writing on existing pen tablets and because of performance and rendering problems with DENIM. To address this, we touched up many of the pages in a paint program. The exported images and HTML were also manually modified to accommodate HTML text entry fields where needed (e.g., name and address fields).

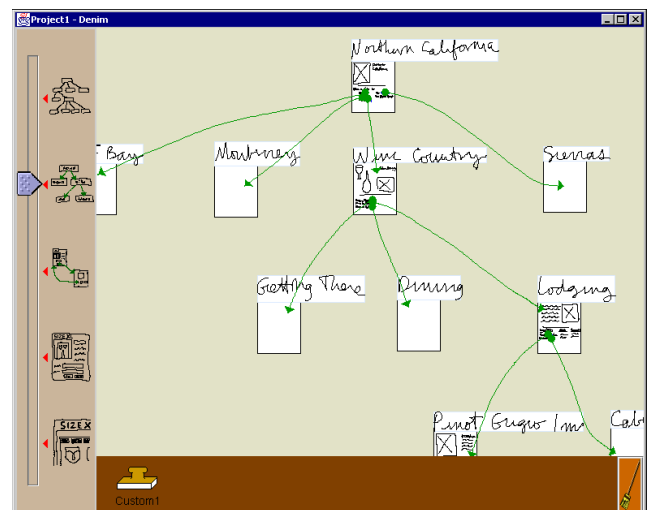


Figure 5. DENIM, an electronic sketch-based web site design tool, was used to sketch out low-fidelity versions of the web sites.

See Figures 2 and 4 for screen shots of the web sites used in the informal condition.

Participants were informed that the web sites represented early designs. They were asked to perform ten tasks total, five for each web site. The two sets of tasks were designed to match in terms of goal and difficulty. The first two tasks were familiarization tasks, in which participants were asked to find specific pieces of information on the site. The next task was a more complex variation of finding a specific piece of information. The fourth task was to add two items to the shopping cart, and the last task was to purchase the items using a provided name, address, and credit card number. No items were actually purchased during the experiment.

After each task, participants were asked for their feedback on how well the web site supported the task. After completing all the tasks for a web site, they were asked for their overall impressions and perceptions of the site. The overall impressions (ease of use, efficiency, etc.) and perception questions were rated on scales of 0–10 (see Appendix A). Lastly, participants were asked to prioritize ten different ways of possibly improving the web site. These improvements, listed in Table 2, were split into visual and non-visual issues.

All of our questions were administered through an online survey and questionnaire service.

Web site improvement	Category
More descriptive text in links	Non-visual
Improved navigation bars	Non-visual
Clearer indicators of what can be clicked on	Non-visual
Clearer scheme for organizing pages on the website	Non-visual
Better page layout	Non-visual
More streamlined shopping cart and checkout	Non-visual
More emphasis on web site brand	Visual
Better use of fonts	Visual
Better use of colors	Visual
Better use of graphics	Visual

Table 2. List of the ten items used in the prioritization task.

PILOT TEST

We ran a pilot test on three people. We found that our overall experimental design worked well, although we ran into a few problems. There were a few minor bugs in our prototype, which we easily fixed. Our participants found our handwriting hard to read, so we rewrote many pages using a paint program, as described in the previous section. Some questions that we asked were also ambiguous. Because we encountered difficulty changing the question's wording on the online survey service, we decided to write

down any clarifications that we would later tell each participant.

QUANTITATIVE ANALYSIS AND RESULTS

Our quantitative analysis consisted of three parts:

- Finding out whether the two web sites were similar enough to have their data combined,
- Analyzing whether participants' overall perceptions of the web sites differed significantly between formal and informal representations, and
- Analyzing whether participants' suggestions for improvements to the web sites differed significantly between formal and informal representations.

Comparing Similarity of Web Sites

First, we compared the overall impressions and perceptions of the two informal sites with each other and the two formal sites with each other in order to determine if the two sites were similar enough to have their data combined. We found that there were a few significant differences in the results between the two web site designs (Appendix B). Between the formal sites, there were significant differences ($p < 0.05$, 2-tailed independent t -test) in perceived attractiveness, quality, and security. These qualities do not necessarily impact the ability of the user to complete their tasks, so we feel that the sites are still fairly similar in design. There was also a difference in perceived likelihood of change in the design, although this question was commonly misinterpreted as the likelihood of change in the content.

However, between the informal sites, there were significant differences ($p < 0.05$, 2-tailed independent t -test) in perceived ease of use, efficiency, complexity, attractiveness, and usefulness. Since these differences did not appear between the formal versions of the web sites, this suggests that there may have been subtle inconsistencies in the translation of the sites from formal to informal. Because of this inconsistency in results between the formal and informal representations, we performed our analysis as both a within subjects test with the sites aggregated, and a between subjects test, analyzing each site separately.

Analysis of Perception Data

With the data aggregated, we performed both a within subjects analysis and between subjects analysis, grouping by site representation. Each participant evaluated one formal and one informal website, allowing for a within-subjects analysis, but since the actual designs were different (and we could not confirm that the designs were similar) it could also be interpreted as a between-subjects analysis.

Within-subjects Analysis

Table 3 shows the means on the perception questions on the within-subjects analysis. The formal designs were found to be significantly more professional, finished, functional, and less likely to change than the informal designs. At the same

time, the formal representations were also overall rated as more attractive, more useful, friendlier, of higher quality, more reliable, and more secure than the informal representations.

Perception	Formal	Informal	<i>p</i>
Professional	8.4	3.6	< 0.01
Finished	8.0	2.4	< 0.01
Functional	8.1	6.5	< 0.05
Likely to Change	4.4	8.7	< 0.01

Table 3. Perception data analyzed as within-subjects (2-tailed *t*-test). The scale is 0–10, where 0 is less and 10 is more.

Between-subjects Analysis

With the two website designs analyzed separately as between-subjects, the results are nearly the same. Formal representations were significantly more professional, more finished, and less likely to change than the informal representations. However, both the formal and informal representations were found to be equally functional when analyzed in this fashion, suggesting that the informal representation does provide similar experience for the user in performing their tasks. Tables 4 and 5 summarize the results.

Perception	Formal	Informal	<i>p</i>
Professional	7.9	2.9	< 0.01
Finished	7.6	1.2	< 0.01
Functional	8.4	6.4	< 0.08
Likely to Change	6.1	9.6	< 0.01

Table 4. Perception data for PeggyLi.com analyzed as between-subjects (2-tailed *t*-test). The scale is 0–10, where 0 is less and 10 is more.

Perception	Formal	Informal	<i>p</i>
Professional	9.0	4.4	< 0.01
Finished	8.4	3.6	< 0.01
Functional	7.8	6.6	< 0.28
Likely to Change	2.6	7.8	< 0.01

Table 5. Perception data for CasadeFruta.com analyzed as between-subjects (2-tailed *t*-test). The scale is 0–10, where 0 is less and 10 is more.

Analysis of Suggestion Data

For each participant’s prioritized suggestions for improving a web site, we separated the suggestions into three bins: 1–3, 4–7 and 8–10. Next, we recoded the rank of each suggestion to the midpoint of the suggestion’s bin: 2, 5.5, and 9, respectively. Then, we found the mean of the recoded ranks of the four visual suggestions, and found the mean of the six non-visual suggestions.

Within-subjects Analysis

Assuming the web sites are similar enough for their data to be aggregated together, we then found the mean ranking of visual issues for informal sites and for formal sites over all participants, and analyzed whether the differences were significant. We did the same for the mean ranking of non-visual issues for informal and formal sites.

Table 6 shows our overall results. We found that, for informal sites, visual suggestions tended to be ranked higher than non-visual suggestions, whereas for formal sites, they are ranked lower.

This does not support our hypothesis that visual suggestions would be more likely to be ranked high for informal representations. This could be caused by the participants’ expectations being raised by viewing the informal representations on the computer. We discuss this possibility further in the Discussion section.

Type of Suggestion	Formal	Informal	<i>p</i>
Visual	5.9	4.8	< 0.005
Non-visual	5.2	5.9	< 0.005

Table 6. Suggestion data analyzed as within-subjects (2-tailed *t*-test). The scale is 1–10, where 1 is *more* important and 10 is less important.

Between-subjects Analysis

To do a between-subjects analysis, we found the mean rankings of visual and non-visual suggestions for the informal and formal representations of the two web sites separately. Tables 7 and 8 show our results.

We found that a between-subjects analysis was much less conclusive. There was no significant difference between the informal and formal representations of either web site. These results suggest that the representation of the web site did not affect which suggestions people believed were important.

Type of Suggestion	Formal	Informal	<i>p</i>
Visual	5.9	5.1	< 0.33
Non-visual	5.2	5.8	< 0.33

Table 7. Suggestion data for PeggyLi.com analyzed as between-subjects (2-tailed *t*-test). The scale is 1–10, where 1 is more important and 10 is less important.

Type of Suggestion	Formal	Informal	<i>p</i>
Visual	5.8	4.6	< 0.12
Non-visual	5.3	6.1	< 0.12

Table 8. Suggestion data for CasadeFruta.com analyzed as between-subjects (2-tailed *t*-test). The scale is 1–10, where 1 is more important and 10 is less important.

QUALITATIVE ANALYSIS

Our observations of participants are that people encountered the same problems on each web site, regardless of whether it was a formal or informal representation. These observations are supported by the subjective freeform comments from participants. It turns out that many of the positive and negative comments for each web site were very similar, regardless of whether it was formal or informal.

For example, on web site A in the formal condition, several people noted that it was difficult to find specific pieces of information:

- “[It’s hard] finding certain things that I’m looking for. It doesn’t allow users to search for things.”

- “It was difficult for me to ascertain whether I had, in fact, located the desired item”
- “[Need to be able to] search for the products desired”
- “A search function is essential for a business site.”

Here are some corresponding remarks from the informal condition of web site A:

- “[It was hard] locating jewelry”
- “The web page is good for finding things if you know exactly what you’re looking for, but for simple ‘window shopping’ I don’t think it’s very well presented”
- “This site could use a search feature.”

There were also similar comments with respect to individual products. Many people felt that there was insufficient detailed information about products. For example, here are some comments from the formal condition of web site A:

- “There should be graphics corresponding to the items on the list.”
- “Needs pictures of the actual item that the user is going to buy.”
- “Maybe, for the benefit of shoppers who don’t have the slightest idea what the various items on the list are, there should be brief verbal descriptions of them.”

Here are some corresponding remarks from the informal condition of web site A:

- “Descriptions of each individual product may help. Also, illustrations of these products actually being worn and used by people may increase their attractiveness.”
- “Show images of products”
- “Why buy without any descriptions or hype?”

Subjective comments were also very similar for web site B, for both the formal and informal conditions. For example, many people noted the lack of a search function. Some responses for the formal condition included:

- “Lack of a SEARCH feature made product select more involved than it should be.”
- “SEARCH FUNCTION! I don’t want to spend the time to think ‘where would I find item X’—I just want to search for what I want and have it come back to me in the results.”

Below are some corresponding remarks from web site B in the informal condition.

- “The ‘search’ option, which apparently was a feature that was not able to be carried out was something that might have made the process a bit easier.”
- “The search option should definitely be working for those who don’t want to go through the entire store directory when looking for a specific item.”

One common problem encountered in web site B is that customers must register before purchasing. However, every participant tried to add things to the shopping cart before registering. This would bring up a page asking people to

register, but this would lead to confusion since the product is not added to the shopping cart, opposite of people’s expectations. Here are some comments from the formal condition of web site B:

- “I didn’t read that I had to register before trying to buy stuff.”
- “Just make it a little more obvious to the user that he/she must register with the company before making online purchases”

Below are some corresponding remarks from the informal condition of web site B:

- “Why in the world do you need to register before adding stuff to your shopping cart?!?!”
- “Shopping cart list adding to cart (item failed to appear)”

There were also several comments about visual appearance. For example, here are some notes from the formal condition:

- “[H]okey graphics”
- “Perhaps add a bit more ‘color’”

Below are some corresponding remarks from the informal condition of web site B:

- “Color! Color! Less ugly fonts. Pictures. Needs color”
- “Graphics obviously need to be changed”

There were also some interesting patterns of behavior. For example, as noted above, many people were frustrated by the fact that web site B requires customers to register before adding items to the shopping cart. This frustration was usually quite obvious. However, when asked to fill out a form after completing the task just a few minutes later, several people said that they had no problems, apparently forgetting their dissatisfaction. This supports the usability evaluation adage, “It’s not what they say, it’s what they do.”

Another interesting observation is that many people were confused with the unfinished nature of the informal prototypes, even giving negative comments about them. This is something that we had not heard of before with paper prototypes, and we believe that this may be due to the electronic nature of our informal prototypes. We discuss the possible consequences of this in the next section.

DISCUSSION

We have two major findings from this experiment. First, informal representations of web sites were more likely to be perceived as less professional, less finished, less functional, and more likely to change than formal representations. This supports our first hypothesis, that there is a difference in how these representations are perceived.

However, we found that these perceptions did not affect the perceived importance of visual improvements versus non-visual improvements. Depending on whether the two sites are considered equivalent, visual improvements are either more likely to be ranked high for informal representations

and less for formal representations, or there is no significant difference in the rankings of the suggested improvements between formal and informal representations. This does not support our second hypothesis, that those looking at informal representations would rank non-visual improvements higher.

There are several possible reasons for these discrepancies. First, although we intended to explore end-user perceptions at the early stages of design, in retrospect we may have been looking more at middle stages of design. Wong describes how sketches are effective in the early stages of a project, when the team is trying to figure out *what* the application should do [6]. However, in our experiment, the web sites had already progressed beyond this stage and instead we were looking at *how* the web sites should work. This was also more explicit in our experiment since our participants used the prototype to complete specific tasks. We need to better identify the intended stage in the web site design process we are evaluating and consider the differences that may occur between task-based evaluations and non-task-based evaluation.

Another reason for these discrepancies may lie with using an electronic medium for presenting the informal representations. It was very difficult for many of the participants to grasp that the web sites used in this experiment represented early stages of design. Many people were very confused as to why there would be an electronic representation of something unfinished. This is in contrast to anecdotal evidence regarding expectations of paper informal prototypes. With a paper prototype, it is clear that it is an early, rough, and unfinished prototype. One way characterize these differences may be to perform a similar experiment comparing informal designs using electronic representations, electronic representations that have been printed out, paper-based representations, and paper-based representations that have been scanned in.

There are also several lessons learned from this experiment. First, informal representations are useful when designers want their designs to be perceived as likely to change and not finished. However, designers that want to use computer-based informal prototypes will have to set expectations properly. These prototypes were significantly perceived as not as professional as cleaned-up prototypes. Furthermore, although we stressed that these were early and unfinished designs, many participants still seemed to have problems understanding this.

Our experiment also demonstrated that informal prototypes are effective in eliciting the same kinds of qualitative feedback as formal prototypes. Since informal prototypes are typically quicker to create than formal prototypes, it

may be more cost-effective to do informal prototypes in the early stages of design.

FUTURE WORK

The results of this experiment show that there are indeed differences in end-user perception of formal and informal representations of web site design. However, it is unclear what affects the type of design changes suggested by the end-users.

In the long-term, we would like to show that, for many basic design issues, low-fidelity informal prototypes are just as effective or better than high-fidelity formal prototypes for evaluation. Then, we would like to demonstrate this for computer-based low-fidelity prototypes, with the overall goal of validating our work in informal interaction techniques. However, from this experiment, we have learned that there are many additional factors to consider beyond just formal and informal, including early to middle to late phases of design, task-based versus non-task-based evaluations, and physical versus electronic media.

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APPENDIX A. QUESTIONS

After completing all tasks on a web site design, participants were asked for their impressions on the site overall and to rank the importance of possible improvements to the design.

Perception Questions

[All responses to perception questions were picked on a scale of 0–10, where 0 is less and 10 is more.]

Based on all the tasks you just performed, what is your *overall* impression of the site? For each pair of terms below, pick the point on the scale that matches your feeling.

- Q1 Hard to use: Easy to use
- Q2 Inefficient: Efficient
- Q3 Poorly organized: Well organized
- Q4 Complex: Simple
- Q5 Unattractive: Attractive
- Q6 Useless: Useful
- Q7 Unfriendly: Friendly
- Q8 Low quality: High quality
- Q9 Unreliable: Reliable
- Q10 Unresponsive: Responsive
- Q11 Insecure: Secure
- Q12 Slow: Fast

How professional did the design look?

Not professional at all: Very professional

How finished did the design of the website look?

Not finished at all: Completely finished

How functional was the website?

Not functional at all: Completely functional

How likely do you think the design of the website will change?

Not likely at all: Very likely

How realistic were the tasks you completed?

Not realistic at all: Very realistic

Suggestions

The participants were asked to rank the following possible improvements to the web site design by importance.

- More descriptive text in links
- Improved navigation bars
- Clearer indicators of what can be clicked on
- Clearer scheme for organizing pages on the website
- Better page layout
- More streamlined shopping cart and checkout
- More emphasis on website brand
- Better use of fonts
- Better use of colors
- Better use of graphics

APPENDIX B. SITE COMPARISON

The following tables show the results of a comparison between PeggyLi.com and CasadeFruta.com, for both the formal and informal representations.

T-Test: Overall Questions, Formal (0 = PeggyLi.com, 1 = CasadeFruta.com)

Group Statistics

	SITE	N	Mean	Std. Deviation	Std. Error Mean
Q1	.00	8	7.2500	2.1213	.7500
	1.00	8	8.3750	1.9226	.6797
Q2	.00	8	7.6250	2.6693	.9437
	1.00	8	7.5000	3.2514	1.1495
Q3	.00	8	6.6250	3.2043	1.1329
	1.00	8	8.8750	2.4165	.8543
Q4	.00	8	7.8750	1.3562	.4795
	1.00	8	8.2500	2.4928	.8814
Q5	.00	8	7.5000	2.0000	.7071
	1.00	8	9.7500	.4629	.1637
Q6	.00	8	8.5000	1.5119	.5345
	1.00	8	9.1250	1.2464	.4407
Q7	.00	8	7.6250	1.8468	.6529
	1.00	8	9.1250	1.2464	.4407
Q8	.00	8	6.8750	2.3566	.8332
	1.00	8	9.0000	1.4142	.5000
Q9	.00	8	8.0000	2.3905	.8452
	1.00	8	8.1250	2.6959	.9531
Q10	.00	8	8.3750	2.3261	.8224
	1.00	8	9.2500	.7071	.2500
Q11	.00	8	9.5000	.7559	.2673
	1.00	8	7.8750	1.9594	.6928
Q12	.00	8	9.2500	1.3887	.4910
	1.00	8	9.2500	1.4880	.5261

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Q1	Equal variances assumed	.190	.670	-1.111	14	.285	-1.1250	1.0122	-3.2960	1.0460
	Equal variances not assumed			-1.111	13.867	.285	-1.1250	1.0122	-3.2979	1.0479
Q2	Equal variances assumed	.510	.487	.084	14	.934	.1250	1.4873	-3.0649	3.3149
	Equal variances not assumed			.084	13.488	.934	.1250	1.4873	-3.0763	3.3263
Q3	Equal variances assumed	2.407	.143	-1.586	14	.135	-2.2500	1.4189	-5.2933	.7933
	Equal variances not assumed			-1.586	13.016	.137	-2.2500	1.4189	-5.3151	.8151
Q4	Equal variances assumed	3.104	.100	-.374	14	.714	-.3750	1.0033	-2.5270	1.7770
	Equal variances not assumed			-.374	10.810	.716	-.3750	1.0033	-2.5881	1.8381
Q5	Equal variances assumed	27.323	.000	-3.100	14	.008	-2.2500	.7258	-3.8067	-.6933
	Equal variances not assumed			-3.100	7.748	.015	-2.2500	.7258	-3.9332	-.5668
Q6	Equal variances assumed	.053	.821	-.902	14	.382	-.6250	.6928	-2.1108	.8608
	Equal variances not assumed			-.902	13.509	.383	-.6250	.6928	-2.1159	.8659
Q7	Equal variances assumed	.994	.336	-1.904	14	.078	-1.5000	.7877	-3.1895	.1895
	Equal variances not assumed			-1.904	12.281	.081	-1.5000	.7877	-3.2120	.2120
Q8	Equal variances assumed	2.910	.110	-2.187	14	.046	-2.1250	.9717	-4.2091	-4.09E-02
	Equal variances not assumed			-2.187	11.463	.050	-2.1250	.9717	-4.2532	3.200E-03
Q9	Equal variances assumed	.013	.912	-.098	14	.923	-.1250	1.2739	-2.8572	2.6072
	Equal variances not assumed			-.098	13.802	.923	-.1250	1.2739	-2.8609	2.6109
Q10	Equal variances assumed	2.616	.128	-1.018	14	.326	-.8750	.8596	-2.7186	.9686
	Equal variances not assumed			-1.018	8.283	.338	-.8750	.8596	-2.8454	1.0954
Q11	Equal variances assumed	3.295	.091	2.188	14	.046	1.6250	.7425	3.245E-02	3.2176
	Equal variances not assumed			2.188	9.039	.056	1.6250	.7425	-5.36E-02	3.3036
Q12	Equal variances assumed	.166	.690	.000	14	1.000	.0000	.7196	-1.5434	1.5434
	Equal variances not assumed			.000	13.934	1.000	.0000	.7196	-1.5441	1.5441

T-Test: Perception Questions, Formal (0 = PeggyLi.com, 1 = CasadeFruta.com)

Group Statistics

GROUPING		N	Mean	Std. Deviation	Std. Error Mean
PROFESSI	.00	8	7.8750	1.4577	.5154
	1.00	8	9.0000	1.1952	.4226
FINISHED	.00	8	7.6250	1.4079	.4978
	1.00	8	8.3750	1.5059	.5324
FUNCTION	.00	8	8.3750	1.5059	.5324
	1.00	8	7.7500	2.5495	.9014
CHANGE	.00	8	6.1250	1.9594	.6928
	1.00	8	2.6250	2.0659	.7304
REALISTI	.00	8	9.6250	.5175	.1830
	1.00	8	9.6250	.5175	.1830

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PROFESSI	Equal variances assumed	.221	.645	-1.688	14	.114	-1.1250	.6665	-2.5545	.3045
	Equal variances not assumed			-1.688	13.482	.114	-1.1250	.6665	-2.5596	.3096
FINISHED	Equal variances assumed	.211	.653	-1.029	14	.321	-.7500	.7289	-2.3133	.8133
	Equal variances not assumed			-1.029	13.937	.321	-.7500	.7289	-2.3139	.8139
FUNCTION	Equal variances assumed	2.579	.131	.597	14	.560	.6250	1.0469	-1.6204	2.8704
	Equal variances not assumed			.597	11.355	.562	.6250	1.0469	-1.6704	2.9204
CHANGE	Equal variances assumed	.171	.686	3.477	14	.004	3.5000	1.0067	1.3409	5.6591
	Equal variances not assumed			3.477	13.961	.004	3.5000	1.0067	1.3403	5.6597
REALISTI	Equal variances assumed	.000	1.000	.000	14	1.000	.0000	.2588	-.5550	.5550
	Equal variances not assumed			.000	14.000	1.000	.0000	.2588	-.5550	.5550

T-Test: Overall Questions, Informal (0 = PeggyLi.com, 1 = CasadeFruta.com)

Group Statistics

	SITE	N	Mean	Std. Deviation	Std. Error Mean
Q1	.00	8	5.2500	2.3755	.8399
	1.00	8	7.8750	2.4749	.8750
Q2	.00	8	5.3750	2.6693	.9437
	1.00	8	8.2500	1.4880	.5261
Q3	.00	8	4.3750	2.6152	.9246
	1.00	8	6.8750	3.2705	1.1563
Q4	.00	8	5.3750	2.6152	.9246
	1.00	8	8.1250	1.9594	.6928
Q5	.00	8	1.6250	2.1339	.7545
	1.00	8	5.7500	2.8158	.9955
Q6	.00	8	5.2500	3.0119	1.0649
	1.00	8	7.8750	1.5526	.5489
Q7	.00	8	5.0000	3.3806	1.1952
	1.00	8	7.7500	1.8323	.6478
Q8	.00	8	3.5000	2.5635	.9063
	1.00	8	6.2500	2.8158	.9955
Q9	.00	8	5.0000	3.7796	1.3363
	1.00	8	6.5000	2.4495	.8660
Q10	.00	8	7.8750	1.9594	.6928
	1.00	8	7.5000	3.0237	1.0690
Q11	.00	8	6.0000	3.2514	1.1495
	1.00	8	5.3750	2.6693	.9437
Q12	.00	8	7.3750	3.3354	1.1792
	1.00	8	9.1250	.9910	.3504

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Q1	Equal variances assumed	.034	.857	-2.164	14	.048	-2.6250	1.2128	-5.2263	-2.37E-02
	Equal variances not assumed			-2.164	13.977	.048	-2.6250	1.2128	-5.2267	-2.33E-02
Q2	Equal variances assumed	1.481	.244	-2.661	14	.019	-2.8750	1.0805	-5.1924	-.5576
	Equal variances not assumed			-2.661	10.968	.022	-2.8750	1.0805	-5.2539	-.4961
Q3	Equal variances assumed	1.676	.216	-1.689	14	.113	-2.5000	1.4805	-5.6754	.6754
	Equal variances not assumed			-1.689	13.354	.115	-2.5000	1.4805	-5.6899	.6899
Q4	Equal variances assumed	2.011	.178	-2.380	14	.032	-2.7500	1.1553	-5.2280	-.2720
	Equal variances not assumed			-2.380	12.976	.033	-2.7500	1.1553	-5.2464	-.2536
Q5	Equal variances assumed	2.533	.134	-3.302	14	.005	-4.1250	1.2491	-6.8041	-1.4459
	Equal variances not assumed			-3.302	13.046	.006	-4.1250	1.2491	-6.8226	-1.4274
Q6	Equal variances assumed	5.138	.040	-2.191	14	.046	-2.6250	1.1980	-5.1945	-5.55E-02
	Equal variances not assumed			-2.191	10.475	.052	-2.6250	1.1980	-5.2781	2.805E-02
Q7	Equal variances assumed	3.365	.088	-2.023	14	.063	-2.7500	1.3595	-5.6658	.1658
	Equal variances not assumed			-2.023	10.786	.069	-2.7500	1.3595	-5.7495	.2495
Q8	Equal variances assumed	.306	.589	-2.043	14	.060	-2.7500	1.3463	-5.6375	.1375
	Equal variances not assumed			-2.043	13.878	.061	-2.7500	1.3463	-5.6399	.1399
Q9	Equal variances assumed	3.604	.078	-.942	14	.362	-1.5000	1.5924	-4.9153	1.9153
	Equal variances not assumed			-.942	11.998	.365	-1.5000	1.5924	-4.9696	1.9696
Q10	Equal variances assumed	1.684	.215	.294	14	.773	.3750	1.2739	-2.3572	3.1072
	Equal variances not assumed			.294	11.998	.774	.3750	1.2739	-2.4006	3.1506
Q11	Equal variances assumed	1.499	.241	.420	14	.681	.6250	1.4873	-2.5649	3.8149
	Equal variances not assumed			.420	13.488	.681	.6250	1.4873	-2.5763	3.8263
Q12	Equal variances assumed	12.154	.004	-1.423	14	.177	-1.7500	1.2302	-4.3885	.8885
	Equal variances not assumed			-1.423	8.226	.192	-1.7500	1.2302	-4.5733	1.0733

T-Test: Perception Questions, Informal (0 = PeggyLi.com, 1 = CasadeFruta.com)

Group Statistics

GROUPING		N	Mean	Std. Deviation	Std. Error Mean
PROFESSI	.00	8	2.8750	2.0310	.7181
	1.00	8	4.3750	3.4615	1.2238
FINISHED	.00	8	1.2500	1.7525	.6196
	1.00	8	3.6250	2.9731	1.0511
FUNCTION	.00	8	6.3750	2.5600	.9051
	1.00	8	6.6250	1.3025	.4605
CHANGE	.00	8	9.6250	1.0607	.3750
	1.00	8	7.7500	3.2842	1.1611
REALISTI	.00	8	8.7500	1.7525	.6196
	1.00	8	9.5000	.7559	.2673

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PROFESSI	Equal variances assumed	6.113	.027	-1.057	14	.308	-1.5000	1.4189	-4.5433	1.5433
	Equal variances not assumed			-1.057	11.309	.313	-1.5000	1.4189	-4.6127	1.6127
FINISHED	Equal variances assumed	6.667	.022	-1.946	14	.072	-2.3750	1.2202	-4.9920	.2420
	Equal variances not assumed			-1.946	11.341	.077	-2.3750	1.2202	-5.0508	.3008
FUNCTION	Equal variances assumed	4.870	.045	-.246	14	.809	-.2500	1.0155	-2.4280	1.9280
	Equal variances not assumed			-.246	10.396	.810	-.2500	1.0155	-2.5010	2.0010
CHANGE	Equal variances assumed	8.751	.010	1.537	14	.147	1.8750	1.2202	-.7420	4.4920
	Equal variances not assumed			1.537	8.445	.161	1.8750	1.2202	-.9132	4.6632
REALISTI	Equal variances assumed	3.080	.101	-1.111	14	.285	-.7500	.6748	-2.1973	.6973
	Equal variances not assumed			-1.111	9.518	.294	-.7500	.6748	-2.2639	.7639

APPENDIX C. WITHIN-SUBJECTS ANALYSIS (SITES AGGREGATED)

The following tables show an analysis of the results, with the PeggyLi.com and CasaDeFruta.com web site data aggregated.

T-Test: All Questions, Between Subjects (0 = formal, 1 = informal)**Group Statistics**

	REPRES	N	Mean	Std. Deviation	Std. Error Mean
Q1	.00	16	7.8125	2.0402	.5101
	1.00	16	6.5625	2.7072	.6768
Q2	.00	16	7.5625	2.8745	.7186
	1.00	16	6.8125	2.5617	.6404
Q3	.00	16	7.7500	2.9777	.7444
	1.00	16	5.6250	3.1385	.7846
Q4	.00	16	8.0625	1.9483	.4871
	1.00	16	6.7500	2.6458	.6614
Q5	.00	16	8.6250	1.8212	.4553
	1.00	16	3.6875	3.2191	.8048
Q6	.00	16	8.8125	1.3769	.3442
	1.00	16	6.5625	2.6825	.6706
Q7	.00	16	8.3750	1.7078	.4270
	1.00	16	6.3750	2.9861	.7465
Q8	.00	16	7.9375	2.1747	.5437
	1.00	16	4.8750	2.9637	.7409
Q9	.00	16	8.0625	2.4622	.6156
	1.00	16	5.7500	3.1728	.7932
Q10	.00	16	8.8125	1.7212	.4303
	1.00	16	7.6875	2.4690	.6172
Q11	.00	16	8.6875	1.6621	.4155
	1.00	16	5.6875	2.8918	.7229
Q12	.00	16	9.2500	1.3904	.3476
	1.00	16	8.2500	2.5430	.6357
PROFESSI	.00	16	8.4375	1.4127	.3532
	1.00	16	3.6250	2.8490	.7122
FINISHED	.00	16	8.0000	1.4606	.3651
	1.00	16	2.4375	2.6575	.6644
FUNCTION	.00	16	8.0625	2.0484	.5121
	1.00	16	6.5000	1.9664	.4916
CHANGE	.00	16	4.3750	2.6552	.6638
	1.00	16	8.6875	2.5487	.6372
REALISTI	.00	16	9.6250	.5000	.1250
	1.00	16	9.1250	1.3601	.3400

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Q1	Equal variances assumed	4.066	.053	1.475	30	.151	1.2500	.8475	-.4808	2.9808
	Equal variances not assumed			1.475	27.883	.151	1.2500	.8475	-.4863	2.9863
Q2	Equal variances assumed	.113	.739	.779	30	.442	.7500	.9626	-1.2159	2.7159
	Equal variances not assumed			.779	29.611	.442	.7500	.9626	-1.2169	2.7169
Q3	Equal variances assumed	.777	.385	1.965	30	.059	2.1250	1.0816	-8.39E-02	4.3339
	Equal variances not assumed			1.965	29.917	.059	2.1250	1.0816	-8.41E-02	4.3341
Q4	Equal variances assumed	2.004	.167	1.598	30	.121	1.3125	.8214	-.3651	2.9901
	Equal variances not assumed			1.598	27.571	.121	1.3125	.8214	-.3713	2.9963
Q5	Equal variances assumed	6.630	.015	5.340	30	.000	4.9375	.9246	3.0491	6.8259
	Equal variances not assumed			5.340	23.710	.000	4.9375	.9246	3.0279	6.8471
Q6	Equal variances assumed	6.102	.019	2.985	30	.006	2.2500	.7538	.7105	3.7895
	Equal variances not assumed			2.985	22.391	.007	2.2500	.7538	.6883	3.8117
Q7	Equal variances assumed	6.429	.017	2.326	30	.027	2.0000	.8600	.2437	3.7563
	Equal variances not assumed			2.326	23.865	.029	2.0000	.8600	.2245	3.7755
Q8	Equal variances assumed	4.397	.045	3.332	30	.002	3.0625	.9190	1.1857	4.9393
	Equal variances not assumed			3.332	27.522	.002	3.0625	.9190	1.1786	4.9464
Q9	Equal variances assumed	3.465	.073	2.303	30	.028	2.3125	1.0040	.2620	4.3630
	Equal variances not assumed			2.303	28.258	.029	2.3125	1.0040	.2567	4.3683
Q10	Equal variances assumed	3.268	.081	1.495	30	.145	1.1250	.7524	-.4117	2.6617
	Equal variances not assumed			1.495	26.794	.147	1.1250	.7524	-.4194	2.6694
Q11	Equal variances assumed	4.724	.038	3.598	30	.001	3.0000	.8339	1.2970	4.7030
	Equal variances not assumed			3.598	23.935	.001	3.0000	.8339	1.2788	4.7212
Q12	Equal variances assumed	2.902	.099	1.380	30	.178	1.0000	.7246	-.4798	2.4798
	Equal variances not assumed			1.380	23.233	.181	1.0000	.7246	-.4981	2.4981
PROFESSI	Equal variances assumed	14.195	.001	6.053	30	.000	4.8125	.7950	3.1889	6.4361
	Equal variances not assumed			6.053	21.956	.000	4.8125	.7950	3.1636	6.4614
FINISHED	Equal variances assumed	9.220	.005	7.337	30	.000	5.5625	.7581	4.0142	7.1108
	Equal variances not assumed			7.337	23.304	.000	5.5625	.7581	3.9954	7.1296
FUNCTION	Equal variances assumed	.018	.893	2.201	30	.036	1.5625	.7099	.1128	3.0122
	Equal variances not assumed			2.201	29.950	.036	1.5625	.7099	.1127	3.0123
CHANGE	Equal variances assumed	1.006	.324	-4.687	30	.000	-4.3125	.9201	-6.1916	-2.4334
	Equal variances not assumed			-4.687	29.950	.000	-4.3125	.9201	-6.1918	-2.4332
REALISTI	Equal variances assumed	5.113	.031	1.380	30	.178	.5000	.3623	-.2399	1.2399
	Equal variances not assumed			1.380	18.981	.184	.5000	.3623	-.2583	1.2583

T-Test: Overall Questions, Within Subjects*GROUPING = .00: Q1 Ease of Use***Paired Samples Statistics^a**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	7.8125	16	2.0402	.5101
	INFORMAL	6.5625	16	2.7072	.6768

a. GROUPING = .00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	-.185	.493

a. GROUPING = .00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	1.2500	3.6788	.9197	-.7103	3.2103	1.359	15	.194

a. GROUPING = .00

*GROUPING = 1.00: Q2 Efficiency***Paired Samples Statistics^a**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	7.5625	16	2.8745	.7186
	INFORMAL	6.8125	16	2.5617	.6404

a. GROUPING = 1.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	.051	.850

a. GROUPING = 1.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	.7500	3.7506	.9376	-1.2485	2.7485	.800	15	.436

a. GROUPING = 1.00

*GROUPING = 2.00: Q3 Organization***Paired Samples Statistics^a**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	7.7500	16	2.9777	.7444
	INFORMAL	5.6250	16	3.1385	.7846

a. GROUPING = 2.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	.196	.467

a. GROUPING = 2.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	2.1250	3.8794	.9699	5.780E-02	4.1922	2.191	15	.045

a. GROUPING = 2.00

GROUPING = 3.00: Q4 Complexity

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	8.0625	16	1.9483	.4871
	INFORMAL	6.7500	16	2.6458	.6614

a. GROUPING = 3.00

Paired Samples Correlations^a

		N	Correlation	Sig.
Pair 1	FORMAL & INFORMAL	16	.145	.591

a. GROUPING = 3.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	1.3125	3.0489	.7622	-.3121	2.9371	1.722	15	.106

a. GROUPING = 3.00

GROUPING = 4.00: Q5 Attractiveness

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	8.6250	16	1.8212	.4553
	INFORMAL	3.6875	16	3.2191	.8048

a. GROUPING = 4.00

Paired Samples Correlations^a

		N	Correlation	Sig.
Pair 1	FORMAL & INFORMAL	16	-.306	.250

a. GROUPING = 4.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	4.9375	4.1548	1.0387	2.7236	7.1514	4.754	15	.000

a. GROUPING = 4.00

GROUPING = 5.00: Q6 Usefulness

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	8.8125	16	1.3769	.3442
	INFORMAL	6.5625	16	2.6825	.6706

a. GROUPING = 5.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	.030	.911

a. GROUPING = 5.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	2.2500	2.9777	.7444	.6633	3.8367	3.022	15	.009

a. GROUPING = 5.00

GROUPING = 6.00: Q7 Friendliness

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	8.3750	16	1.7078	.4270
	INFORMAL	6.3750	16	2.9861	.7465

a. GROUPING = 6.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	-.069	.801

a. GROUPING = 6.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	2.0000	3.5402	.8851	.1135	3.8865	2.260	15	.039

a. GROUPING = 6.00

GROUPING = 7.00: Q8 Quality

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	7.9375	16	2.1747	.5437
	INFORMAL	4.8750	16	2.9637	.7409

a. GROUPING = 7.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	-.105	.699

a. GROUPING = 7.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	3.0625	3.8552	.9638	1.0082	5.1168	3.178	15	.006

a. GROUPING = 7.00

GROUPING = 8.00: Q9 Reliability

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	8.0625	16	2.4622	.6156
	INFORMAL	5.7500	16	3.1728	.7932

a. GROUPING = 8.00

Paired Samples Correlations^a

		N	Correlation	Sig.
Pair 1	FORMAL & INFORMAL	16	-.160	.554

a. GROUPING = 8.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	2.3125	4.3162	1.0790	1.259E-02	4.6124	2.143	15	.049

a. GROUPING = 8.00

GROUPING = 9.00: Q10 Responsiveness

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	8.8125	16	1.7212	.4303
	INFORMAL	7.6875	16	2.4690	.6172

a. GROUPING = 9.00

Paired Samples Correlations^a

		N	Correlation	Sig.
Pair 1	FORMAL & INFORMAL	16	.315	.235

a. GROUPING = 9.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	1.1250	2.5265	.6316	-.2213	2.4713	1.781	15	.095

a. GROUPING = 9.00

GROUPING = 10.00: Q11 Security

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	8.6875	16	1.6621	.4155
	INFORMAL	5.6875	16	2.8918	.7229

a. GROUPING = 10.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	-.119	.661

a. GROUPING = 10.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	3.0000	3.5024	.8756	1.1337	4.8663	3.426	15	.004

a. GROUPING = 10.00

GROUPING = 11.00: Q12 Speed

Paired Samples Statistics^a

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 FORMAL	9.2500	16	1.3904	.3476
1 INFORMAL	8.2500	16	2.5430	.6357

a. GROUPING = 11.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	.434	.093

a. GROUPING = 11.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	1.0000	2.3094	.5774	-.2306	2.2306	1.732	15	.104

a. GROUPING = 11.00

T-Test: Perception Questions, Within Subjects

GROUPING = .00: How professional...?

Paired Samples Statistics^a

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 FORMAL	8.4375	16	1.4127	.3532
1 INFORMAL	3.6250	16	2.8490	.7122

a. GROUPING = .00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	.143	.598

a. GROUPING = .00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
				Std. Error	95% Confidence Interval of the Difference				
					Mean	Lower			
Pair 1	FORMAL - INFORMAL	4.8125	2.9937	.7484	3.2172	6.4078	6.430	15	.000

a. GROUPING = .00

GROUPING = 1.00: How finished...?

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	8.0000	16	1.4606	.3651
	INFORMAL	2.4375	16	2.6575	.6644

a. GROUPING = 1.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	-.069	.800

a. GROUPING = 1.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
				Std. Error	95% Confidence Interval of the Difference				
					Mean	Lower			
Pair 1	FORMAL - INFORMAL	5.5625	3.1192	.7798	3.9004	7.2246	7.133	15	.000

a. GROUPING = 1.00

GROUPING = 2.00: How functional...?

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	8.0625	16	2.0484	.5121
	INFORMAL	6.5000	16	1.9664	.4916

a. GROUPING = 2.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	.025	.927

a. GROUPING = 2.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	1.5625	2.8040	.7010	6.835E-02	3.0567	2.229	15	.042

a. GROUPING = 2.00

GROUPING = 3.00: How likely to change...?

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	4.3750	16	2.6552	.6638
	INFORMAL	8.6875	16	2.5487	.6372

a. GROUPING = 3.00

Paired Samples Correlations^a

	N	Correlation	Sig.
Pair 1 FORMAL & INFORMAL	16	-.011	.968

a. GROUPING = 3.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	-4.3125	3.7008	.9252	-6.2845	-2.3405	-4.661	15	.000

a. GROUPING = 3.00

GROUPING = 4.00: How realistic...?

Paired Samples Statistics^a

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FORMAL	9.6250	16	.5000	.1250
	INFORMAL	9.1250	16	1.3601	.3400

a. GROUPING = 4.00

Paired Samples Correlations^a

		N	Correlation	Sig.
Pair 1	FORMAL & INFORMAL	16	.172	.525

a. GROUPING = 4.00

Paired Samples Test^a

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FORMAL - INFORMAL	.5000	1.3663	.3416	-.2280	1.2280	1.464	15	.164

a. GROUPING = 4.00

Ranking of Suggestions

	Formal		Informal	
	Visual	Non-Visual	Visual	Non-Visual
Participant 1	3.75	6.67	2.88	7.25
2	6.38	4.92	5.50	5.50
3	6.38	4.92	5.50	5.50
4	4.63	6.08	4.63	6.08
5	4.63	6.08	2.88	7.25
6	5.50	5.50	4.63	6.08
7	8.13	3.75	5.50	5.50
8	8.13	3.75	5.50	5.50
9	6.38	4.92	8.13	3.75
10	2.88	7.25	3.75	6.67
11	5.50	5.50	3.75	6.67
12	8.13	3.75	7.25	4.33
13	7.25	4.33	5.50	5.50
14	6.38	4.92	3.75	6.67
15	6.38	4.92	4.63	6.08
16	3.75	6.67	3.75	6.67
Mean	5.88	5.24	4.84	5.94

	Visual	Non-Visual
p (2-tailed t-test)	0.00453	0.00453

APPENDIX D. BETWEEN-SUBJECTS ANALYSIS OF PEGGYLI.COM

The following tables present an analysis of the PeggyLi.com data alone.

T-Test: All Questions, Between Subjects (0 = formal, 1 = informal)

Group Statistics

	REPRES	N	Mean	Std. Deviation	Std. Error Mean
Q1	.00	8	7.2500	2.1213	.7500
	1.00	8	5.2500	2.3755	.8399
Q2	.00	8	7.6250	2.6693	.9437
	1.00	8	5.3750	2.6693	.9437
Q3	.00	8	6.6250	3.2043	1.1329
	1.00	8	4.3750	2.6152	.9246
Q4	.00	8	7.8750	1.3562	.4795
	1.00	8	5.3750	2.6152	.9246
Q5	.00	8	7.5000	2.0000	.7071
	1.00	8	1.6250	2.1339	.7545
Q6	.00	8	8.5000	1.5119	.5345
	1.00	8	5.2500	3.0119	1.0649
Q7	.00	8	7.6250	1.8468	.6529
	1.00	8	5.0000	3.3806	1.1952
Q8	.00	8	6.8750	2.3566	.8332
	1.00	8	3.5000	2.5635	.9063
Q9	.00	8	8.0000	2.3905	.8452
	1.00	8	5.0000	3.7796	1.3363
Q10	.00	8	8.3750	2.3261	.8224
	1.00	8	7.8750	1.9594	.6928
Q11	.00	8	9.5000	.7559	.2673
	1.00	8	6.0000	3.2514	1.1495
Q12	.00	8	9.2500	1.3887	.4910
	1.00	8	7.3750	3.3354	1.1792
PROFESSI	.00	8	7.8750	1.4577	.5154
	1.00	8	2.8750	2.0310	.7181
FINISHED	.00	8	7.6250	1.4079	.4978
	1.00	8	1.2500	1.7525	.6196
FUNCTION	.00	8	8.3750	1.5059	.5324
	1.00	8	6.3750	2.5600	.9051
CHANGE	.00	8	6.1250	1.9594	.6928
	1.00	8	9.6250	1.0607	.3750
REALISTI	.00	8	9.6250	.5175	.1830
	1.00	8	8.7500	1.7525	.6196

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Q1	Equal variances assumed	.011	.919	1.776	14	.097	2.0000	1.1260	-.4150	4.4150
	Equal variances not assumed			1.776	13.824	.098	2.0000	1.1260	-.4179	4.4179
Q2	Equal variances assumed	.014	.907	1.686	14	.114	2.2500	1.3346	-.6125	5.1125
	Equal variances not assumed			1.686	14.000	.114	2.2500	1.3346	-.6125	5.1125
Q3	Equal variances assumed	.659	.430	1.539	14	.146	2.2500	1.4623	-.8864	5.3864
	Equal variances not assumed			1.539	13.459	.147	2.2500	1.4623	-.8982	5.3982
Q4	Equal variances assumed	9.124	.009	2.400	14	.031	2.5000	1.0415	.2661	4.7339
	Equal variances not assumed			2.400	10.511	.036	2.5000	1.0415	.1945	4.8055
Q5	Equal variances assumed	.017	.897	5.682	14	.000	5.8750	1.0340	3.6572	8.0928
	Equal variances not assumed			5.682	13.942	.000	5.8750	1.0340	3.6564	8.0936
Q6	Equal variances assumed	5.860	.030	2.728	14	.016	3.2500	1.1915	.6945	5.8055
	Equal variances not assumed			2.728	10.317	.021	3.2500	1.1915	.6062	5.8938
Q7	Equal variances assumed	3.520	.082	1.927	14	.074	2.6250	1.3620	-.2961	5.5461
	Equal variances not assumed			1.927	10.836	.081	2.6250	1.3620	-.3782	5.6282
Q8	Equal variances assumed	.136	.718	2.741	14	.016	3.3750	1.2311	.7345	6.0155
	Equal variances not assumed			2.741	13.902	.016	3.3750	1.2311	.7328	6.0172
Q9	Equal variances assumed	4.065	.063	1.897	14	.079	3.0000	1.5811	-.3912	6.3912
	Equal variances not assumed			1.897	11.828	.082	3.0000	1.5811	-.4506	6.4506
Q10	Equal variances assumed	.017	.899	.465	14	.649	.5000	1.0753	-1.8063	2.8063
	Equal variances not assumed			.465	13.607	.649	.5000	1.0753	-1.8125	2.8125
Q11	Equal variances assumed	17.591	.001	2.966	14	.010	3.5000	1.1802	.9687	6.0313
	Equal variances not assumed			2.966	7.755	.019	3.5000	1.1802	.7634	6.2366
Q12	Equal variances assumed	8.475	.011	1.468	14	.164	1.8750	1.2774	-.8647	4.6147
	Equal variances not assumed			1.468	9.356	.175	1.8750	1.2774	-.9980	4.7480
PROFESSI	Equal variances assumed	1.031	.327	5.657	14	.000	5.0000	.8839	3.1043	6.8957
	Equal variances not assumed			5.657	12.700	.000	5.0000	.8839	3.0859	6.9141
FINISHED	Equal variances assumed	.172	.685	8.021	14	.000	6.3750	.7948	4.6703	8.0797
	Equal variances not assumed			8.021	13.378	.000	6.3750	.7948	4.6629	8.0871
FUNCTION	Equal variances assumed	3.347	.089	1.905	14	.078	2.0000	1.0501	-.2522	4.2522
	Equal variances not assumed			1.905	11.327	.083	2.0000	1.0501	-.3031	4.3031
CHANGE	Equal variances assumed	5.163	.039	-4.443	14	.001	-3.5000	.7877	-5.1895	-1.8105
	Equal variances not assumed			-4.443	10.778	.001	-3.5000	.7877	-5.2382	-1.7618
REALISTI	Equal variances assumed	5.088	.041	1.354	14	.197	.8750	.6461	-.5107	2.2607
	Equal variances not assumed			1.354	8.212	.212	.8750	.6461	-.6082	2.3582

Ranking of Suggestions

Participant	Representation	Visual	Non-Visual
2	Formal	6.38	4.92
3	Formal	6.38	4.92
6	Formal	5.50	5.50
7	Formal	8.13	3.75
10	Formal	2.88	7.25
11	Formal	5.50	5.50
14	Formal	6.38	4.92
15	Formal	6.38	4.92
<i>Mean</i>		<i>5.94</i>	<i>5.21</i>
1	Informal	2.88	7.25
4	Informal	4.63	6.08
5	Informal	2.88	7.25
8	Informal	5.50	5.50
9	Informal	8.13	3.75
12	Informal	7.25	4.33
13	Informal	5.50	5.50
16	Informal	3.75	6.67
<i>Mean</i>		<i>5.06</i>	<i>5.79</i>
<i>p</i> (2-tailed <i>t</i> -test)		0.33	0.33

APPENDIX E. BETWEEN-SUBJECTS ANALYSIS OF CASADEFRUTA.COM

The following tables show an analysis of the CasaDeFruta.com data alone.

T-Test: All Questions, Between Subjects (0 = formal, 1 = informal)

Group Statistics

	REPRES	N	Mean	Std. Deviation	Std. Error Mean
Q1	.00	8	8.3750	1.9226	.6797
	1.00	8	7.8750	2.4749	.8750
Q2	.00	8	7.5000	3.2514	1.1495
	1.00	8	8.2500	1.4880	.5261
Q3	.00	8	8.8750	2.4165	.8543
	1.00	8	6.8750	3.2705	1.1563
Q4	.00	8	8.2500	2.4928	.8814
	1.00	8	8.1250	1.9594	.6928
Q5	.00	8	9.7500	.4629	.1637
	1.00	8	5.7500	2.8158	.9955
Q6	.00	8	9.1250	1.2464	.4407
	1.00	8	7.8750	1.5526	.5489
Q7	.00	8	9.1250	1.2464	.4407
	1.00	8	7.7500	1.8323	.6478
Q8	.00	8	9.0000	1.4142	.5000
	1.00	8	6.2500	2.8158	.9955
Q9	.00	8	8.1250	2.6959	.9531
	1.00	8	6.5000	2.4495	.8660
Q10	.00	8	9.2500	.7071	.2500
	1.00	8	7.5000	3.0237	1.0690
Q11	.00	8	7.8750	1.9594	.6928
	1.00	8	5.3750	2.6693	.9437
Q12	.00	8	9.2500	1.4880	.5261
	1.00	8	9.1250	.9910	.3504
PROFESSI	.00	8	9.0000	1.1952	.4226
	1.00	8	4.3750	3.4615	1.2238
FINISHED	.00	8	8.3750	1.5059	.5324
	1.00	8	3.6250	2.9731	1.0511
FUNCTION	.00	8	7.7500	2.5495	.9014
	1.00	8	6.6250	1.3025	.4605
CHANGE	.00	8	2.6250	2.0659	.7304
	1.00	8	7.7500	3.2842	1.1611
REALISTI	.00	8	9.6250	.5175	.1830
	1.00	8	9.5000	.7559	.2673

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Q1	Equal variances assumed	.463	.507	.451	14	.659	.5000	1.1080	-1.8764	2.8764
	Equal variances not assumed			.451	13.193	.659	.5000	1.1080	-1.8901	2.8901
Q2	Equal variances assumed	5.011	.042	-.593	14	.562	-.7500	1.2642	-3.4615	1.9615
	Equal variances not assumed			-.593	9.809	.566	-.7500	1.2642	-3.5743	2.0743
Q3	Equal variances assumed	3.742	.074	1.391	14	.186	2.0000	1.4377	-1.0835	5.0835
	Equal variances not assumed			1.391	12.888	.188	2.0000	1.4377	-1.1087	5.1087
Q4	Equal variances assumed	.166	.690	.112	14	.913	.1250	1.1210	-2.2794	2.5294
	Equal variances not assumed			.112	13.260	.913	.1250	1.1210	-2.2920	2.5420
Q5	Equal variances assumed	43.043	.000	3.965	14	.001	4.0000	1.0089	1.8361	6.1639
	Equal variances not assumed			3.965	7.378	.005	4.0000	1.0089	1.6389	6.3611
Q6	Equal variances assumed	.029	.867	1.776	14	.098	1.2500	.7039	-.2598	2.7598
	Equal variances not assumed			1.776	13.375	.099	1.2500	.7039	-.2665	2.7665
Q7	Equal variances assumed	2.333	.149	1.755	14	.101	1.3750	.7835	-.3054	3.0554
	Equal variances not assumed			1.755	12.336	.104	1.3750	.7835	-.3269	3.0769
Q8	Equal variances assumed	8.284	.012	2.469	14	.027	2.7500	1.1140	.3606	5.1394
	Equal variances not assumed			2.469	10.320	.033	2.7500	1.1140	.2782	5.2218
Q9	Equal variances assumed	.001	.970	1.262	14	.228	1.6250	1.2878	-1.1371	4.3871
	Equal variances not assumed			1.262	13.873	.228	1.6250	1.2878	-1.1395	4.3895
Q10	Equal variances assumed	9.271	.009	1.594	14	.133	1.7500	1.0979	-.6047	4.1047
	Equal variances not assumed			1.594	7.763	.151	1.7500	1.0979	-.7952	4.2952
Q11	Equal variances assumed	.121	.733	2.135	14	.051	2.5000	1.1707	-1.09E-02	5.0109
	Equal variances not assumed			2.135	12.846	.053	2.5000	1.1707	-3.22E-02	5.0322
Q12	Equal variances assumed	.571	.462	.198	14	.846	.1250	.6321	-1.2307	1.4807
	Equal variances not assumed			.198	12.189	.846	.1250	.6321	-1.2499	1.4999
PROFESSI	Equal variances assumed	18.683	.001	3.572	14	.003	4.6250	1.2947	1.8481	7.4019
	Equal variances not assumed			3.572	8.646	.006	4.6250	1.2947	1.6777	7.5723
FINISHED	Equal variances assumed	10.653	.006	4.031	14	.001	4.7500	1.1783	2.2228	7.2772
	Equal variances not assumed			4.031	10.370	.002	4.7500	1.1783	2.1372	7.3628
FUNCTION	Equal variances assumed	3.723	.074	1.111	14	.285	1.1250	1.0122	-1.0460	3.2960
	Equal variances not assumed			1.111	10.421	.291	1.1250	1.0122	-1.1180	3.3680
CHANGE	Equal variances assumed	2.491	.137	-3.736	14	.002	-5.1250	1.3717	-8.0671	-2.1829
	Equal variances not assumed			-3.736	11.790	.003	-5.1250	1.3717	-8.1197	-2.1303
REALISTI	Equal variances assumed	1.378	.260	.386	14	.705	.1250	.3239	-.5697	.8197
	Equal variances not assumed			.386	12.380	.706	.1250	.3239	-.5783	.8283

Participant	Representation	Visual	Non-Visual
1	Formal	3.75	6.67
4	Formal	4.63	6.08
5	Formal	4.63	6.08
8	Formal	8.13	3.75
9	Formal	6.38	4.92
12	Formal	8.13	3.75
13	Formal	7.25	4.33
16	Formal	3.75	6.67
<i>Mean</i>		5.83	5.28
2	Informal	5.50	5.50
3	Informal	5.50	5.50
6	Informal	4.63	6.08
7	Informal	5.50	5.50
10	Informal	3.75	6.67
11	Informal	3.75	6.67
14	Informal	3.75	6.67
15	Informal	4.63	6.08
<i>Mean</i>		4.63	6.08
<i>p</i> (2-tailed <i>t</i> -test)		0.12	0.12