

A Comparison of Questionnaires for Assessing Website Usability

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Background

- Various questionnaires have been reported in the literature for assessing the perceived usability of an interactive system, e.g:
 - Questionnaire for User Interface Satisfaction (QUIS) (1988)
 - Computer System Usability Questionnaire (CSUQ) (1995)
 - System Usability Scale (SUS) (1996)

Background

- A slightly different approach was taken by Microsoft with their “Product Reaction Cards” (2002)
- And we have been using our own questionnaire for several years in our Usability Lab at Fidelity Investments

The Problem

- How well do these questionnaires apply to the assessment of Websites?
- Do any of these questionnaires work well, as an adjunct to a usability test, with relatively small numbers of users?

Our Study

- Limited ourselves to questionnaires in the published literature
 - Did not include commercial services for evaluating website usability (e.g., WAMMI, RelevantView, NetRaker, Vividence).
- We studied five questionnaires:
 - SUS
 - QUIS
 - CSUQ
 - Microsoft's "Words"
 - Our own questionnaire

Questionnaire #1: SUS

- Developed at Digital Equipment Corp.
- Consists of ten items.
- Adapted by replacing “system” with “website”.
- Each item is a statement (positive or negative) and a rating on a five-point scale of “Strongly Disagree” to “Strongly Agree” .

Questionnaire #1: SUS

	Strongly Disagree				Strongly Agree
1. I think I would like to use this website frequently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I found the website unnecessarily complex.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I thought the website was easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I think I would need Tech Support to be able to use this website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I found the various functions in this website were well integrated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I thought there was too much inconsistency in this website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I would imagine that most people would learn to use this website very quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I found the website very cumbersome to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I felt very confident using the website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I need to learn a lot about this website before I could effectively use it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Questionnaire #2: QUIS

- Developed at the University of Maryland.
- Original questionnaire had 27 questions.
 - We dropped 3 that did not seem relevant to Websites (e.g., “Remembering names and use of commands”).
- “System” was replaced by “website” and term “screen” was replaced by “web page”.
- Each question is a rating on a ten-point scale with appropriate anchors.

Questionnaire #2: QUIS

Overall Reaction to the Website		0	1	2	3	4	5	6	7	8	9		NA
1.	terrible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	wonderful	<input type="radio"/>
2.	difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
3.	frustrating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	satisfying	<input type="radio"/>
4.	dull	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	stimulating	<input type="radio"/>
5.	rigid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	flexible	<input type="radio"/>

Web Page		0	1	2	3	4	5	6	7	8	9		NA
6.	Reading characters on the page	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
7.	Organization of information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	very clear	<input type="radio"/>
8.	Sequence of pages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	very clear	<input type="radio"/>

Terminology and Website Information		0	1	2	3	4	5	6	7	8	9		NA
9.	Use of terms throughout website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	consistent	<input type="radio"/>
10.	Terminology is intuitive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	always	<input type="radio"/>
11.	Position of messages on screen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	consistent	<input type="radio"/>
12.	Prompts for input	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	clear	<input type="radio"/>
13.	Website informs about its progress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	always	<input type="radio"/>
14.	Error messages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	helpful	<input type="radio"/>

Questionnaire #2: QUIS (cont.)

Learning		0	1	2	3	4	5	6	7	8	9	NA
15. Learning to use the website	difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
16. Exploring new features by trial and error	difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
17. Performing tasks is straightforward	never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	always	<input type="radio"/>
18. Help messages on the screen	unhelpful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	helpful	<input type="radio"/>
19. Supplemental reference materials	confusing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	clear	<input type="radio"/>

Website Capabilities		0	1	2	3	4	5	6	7	8	9	NA
20. Website speed	too slow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	fast enough	<input type="radio"/>
21. Website reliability	unreliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reliable	<input type="radio"/>
22. Sounds associated with this website	detracts value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	adds value	<input type="radio"/>
23. Correcting your mistakes	difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	<input type="radio"/>
24. Designed for all levels of users	never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	always	<input type="radio"/>

Questionnaire #3: CSUQ

- Developed at IBM.
- Composed of 19 questions.
- "System" or "computer system" was replaced by "website".
- Each question is a statement and a rating on a seven-point scale of "Strongly Disagree" to "Strongly Agree".

Questionnaire #3: CSUQ

Overall Reaction to the Website		1	2	3	4	5	6	7		NA
1. Overall, I am satisfied with how easy it is to use this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
2. It was simple to use this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
3. I can effectively complete my work using this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
4. I am able to complete my work quickly using this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
5. I am able to efficiently complete my work using this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
6. I feel comfortable using this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
7. It was easy to learn to use this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
8. I believe I became productive quickly using this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
9. The website gives error messages that clearly tell me how to fix problems	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
10. Whenever I make a mistake using the website, I recover easily and quickly	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>

Questionnaire #3: CSUQ (cont.)

11. The information (such as online help, on-page messages, and other documentation) provided with this website is clear	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
12. It is easy to find the information I need	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
13. The information provided by the website is easy to understand	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
14. The information is effective in helping me complete the tasks and scenarios	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
15. The organization of information on the website pages is clear	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
16. The interface of this website is pleasant	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
17. I like using the interface of this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
18. This website has all the functions and capabilities I expect it to have	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>
19. Overall, I am satisfied with this website	strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree	<input type="radio"/>

Questionnaire #4: Words

- Based on the 118 words used by Microsoft on their Product Reaction Cards.
 - Some positive (e.g., "Convenient")
 - Some negative (e.g., "Unattractive")
- Each word was presented with a check-box
 - Users were asked to choose the words that best describe their interaction with the website.
 - Could choose as many or as few words as they wished.

Questionnaire #4: Words

<input type="checkbox"/> Convenient	<input type="checkbox"/> Familiar	<input type="checkbox"/> Slow	<input type="checkbox"/> Cutting Edge	<input type="checkbox"/> Friendly
<input type="checkbox"/> Busy	<input type="checkbox"/> Straight forward	<input type="checkbox"/> Personal	<input type="checkbox"/> Confusing	<input type="checkbox"/> Stressful
<input type="checkbox"/> Fun	<input type="checkbox"/> Boring	<input type="checkbox"/> Innovative	<input type="checkbox"/> Helpful	<input type="checkbox"/> Simplistic
<input type="checkbox"/> Empowering	<input type="checkbox"/> Usable	<input type="checkbox"/> Old	<input type="checkbox"/> Complex	<input type="checkbox"/> Irrelevant
<input type="checkbox"/> Dated	<input type="checkbox"/> Dull	<input type="checkbox"/> Advanced	<input type="checkbox"/> Patronizing	<input type="checkbox"/> Meaningful
<input type="checkbox"/> Clear	<input type="checkbox"/> Flexible	<input type="checkbox"/> Sophisticated	<input type="checkbox"/> Effective	<input type="checkbox"/> Difficult
<input type="checkbox"/> Accessible	<input type="checkbox"/> Time saving	<input type="checkbox"/> Business-like	<input type="checkbox"/> Too Technical	<input type="checkbox"/> Intuitive
<input type="checkbox"/> Organized	<input type="checkbox"/> Calm	<input type="checkbox"/> Disruptive	<input type="checkbox"/> Fast	<input type="checkbox"/> Consistent
<input type="checkbox"/> Controllable	<input type="checkbox"/> Annoying	<input type="checkbox"/> Easy to use	<input type="checkbox"/> Met Expectations	<input type="checkbox"/> Powerful
<input type="checkbox"/> Novel	<input type="checkbox"/> Comfortable	<input type="checkbox"/> Approachable	<input type="checkbox"/> Collaborative	<input type="checkbox"/> Distracting
<input type="checkbox"/> Frustrating	<input type="checkbox"/> Attractive	<input type="checkbox"/> Efficient	<input type="checkbox"/> Ordinary	<input type="checkbox"/> High Quality
<input type="checkbox"/> Valuable	<input type="checkbox"/> Gets in the way	<input type="checkbox"/> Fragile	<input type="checkbox"/> Connected	<input type="checkbox"/> Overbearing
<input type="checkbox"/> Sterile	<input type="checkbox"/> Exciting	<input type="checkbox"/> Desirable	<input type="checkbox"/> Overwhelming	<input type="checkbox"/> Secure
<input type="checkbox"/> Predictable	<input type="checkbox"/> Intimidating	<input type="checkbox"/> Appealing	<input type="checkbox"/> Clean	<input type="checkbox"/> Understandable
<input type="checkbox"/> Low Maintenance	<input type="checkbox"/> Comprehensive	<input type="checkbox"/> Unrefined	<input type="checkbox"/> Unconventional	<input type="checkbox"/> Effortless
<input type="checkbox"/> Inviting	<input type="checkbox"/> Entertaining	<input type="checkbox"/> Confident	<input type="checkbox"/> Optimistic	<input type="checkbox"/> Enthusiastic
<input type="checkbox"/> Customizable	<input type="checkbox"/> Time consuming	<input type="checkbox"/> Stable	<input type="checkbox"/> Unattractive	<input type="checkbox"/> Stimulating
<input type="checkbox"/> Not valuable	<input type="checkbox"/> Relevant	<input type="checkbox"/> Inconsistent	<input type="checkbox"/> Compelling	<input type="checkbox"/> Reliable
<input type="checkbox"/> Professional	<input type="checkbox"/> Compatible	<input type="checkbox"/> Incomprehensible	<input type="checkbox"/> Useful	<input type="checkbox"/> Undesirable
<input type="checkbox"/> Not secure	<input type="checkbox"/> Trustworthy	<input type="checkbox"/> Integrated	<input type="checkbox"/> Disconnected	<input type="checkbox"/> Energetic
<input type="checkbox"/> Engaging	<input type="checkbox"/> Motivating	<input type="checkbox"/> Poor quality	<input type="checkbox"/> Impressive	<input type="checkbox"/> Unpredictable
<input type="checkbox"/> Hard to use	<input type="checkbox"/> Ineffective	<input type="checkbox"/> Creative	<input type="checkbox"/> Uncontrollable	<input type="checkbox"/> Fresh
<input type="checkbox"/> Responsive	<input type="checkbox"/> Essential	<input type="checkbox"/> Satisfying	<input type="checkbox"/> Exceptional	
<input type="checkbox"/> Impersonal	<input type="checkbox"/> Inspiring	<input type="checkbox"/> Unapproachable	<input type="checkbox"/> Rigid	

Questionnaire #5: Ours

- Developed ourselves and have been using for several years in our usability tests of websites.
- Composed of nine statements (e.g., “This website is visually appealing”) to which the user responds on a seven-point scale from “Strongly Disagree” to “Strongly Agree”.
- Points of the scale are numbered -3, -2, -1, 0, 1, 2, 3.
 - Obvious neutral point at 0.

Questionnaire #5: Ours

	Strongly Disagree	-3	-2	-1	0	1	2	3	Strongly Agree
1. This website is visually appealing.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2. It was easy to move from one page to another.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3. The overall organization of the site is easy to understand.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4. Individual pages are well designed.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
5. Terminology used in this website is clear.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
6. The content of the website met my expectations.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
7. I would be likely to use this website in the future.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
8. I was able to complete my tasks in a reasonable amount of time.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
9. Overall, the website is easy to use.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

A Live Experiment!

- We're going to compare two sites:
 - CircuitCity.com
 - Outpost.com
- Task 1: Your digital camera uses SmartMedia cards. Find the least expensive external reader (USB) for your PC that will read them.
- Task 2: You do lots of hiking. Find the least expensive personal GPS with map capability and at least 8 MB of memory.

Camtasia Videos

- Task 1
 - Circuit City
 - Outpost
- Task 2
 - Outpost
 - Circuit City
- (For fun: One more video!)

Method of Our Study

- Conducted entirely on our company Intranet.
- 123 of our employees participated.
- Each participant was randomly assigned to one of the five questionnaire conditions.
- Each was asked to perform two tasks on each of two well-known personal financial information sites.

Method of the Study

- Sites studied:
 - Finance.Yahoo.com
 - Kiplinger.com
 - Hereafter referred to only as “Site 1” and “Site 2”. Don’t assume which is which.
- Tasks:
 - Find the highest price in the past year for a share of <company name>.
 - Find the mutual fund with the highest 3-year return.
- Demo!

Finance.Yahoo.com

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Nasdaq 4-Jun @ 4:00pm (C)Yahoo!



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[Nasdaq](#) 1,978.62 +18.36 (+0.94%)
[S&P 500](#) 1,122.50 +5.86 (+0.52%)
[10-Yr Bond](#) 4.774% +0.062
[NYSE Volume](#) 1,115,333,000
[Nasdaq Volume](#) 1,426,217,000

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Top Stories

[Goldilocks Economy' Could Be Pure Fantasy](#)
Sat 1:21pm ET - Reuters
A not-too-hot and not-too-cold economic story has warmed the hearts of Wall Street investors for months. Stocks rose Friday after the release of a long-awaited jobs report that showed an economy that still isn't growing fast enough to require drastic tightening by Alan Greenspan's Federal Reserve.

[Most Actives](#), [US Indices](#), [World Indices](#)

Market Overview

Sat 10:03am ET
Weekly Recap - It was a short week of trading that was long on important developments for investors. Specifically, OPEC announced an increase in its output target to help bring down oil prices, same-store sales for May were strong, Intel (INTC) provided a better than expected mid-quarter...[more](#)

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DOW NASDAQ S&P500



DOW	10,242.80	▲ 46.90
NASDAQ	1,978.80	▲ 18.30
S&P 500	1,122.50	▲ 5.86

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Method of the Study

- Order of presentation of the two sites was randomized.
- After completing (or at least attempting) the two tasks on a site, the user was presented with the questionnaire for their randomly selected condition.
- Each user completed the same questionnaire for both sites.

Data Analysis

- For each participant, an overall score was calculated for each website by averaging all of the ratings on the questionnaire that was used.
 - All scales had been coded internally so that the “better” end corresponded to higher numbers.
 - These were converted to percentages by dividing each score by the maximum score possible on that scale.
 - For example, a rating of 3 on SUS was converted to a percentage by dividing that by 5 (the maximum score for SUS), giving a percentage of 60%.

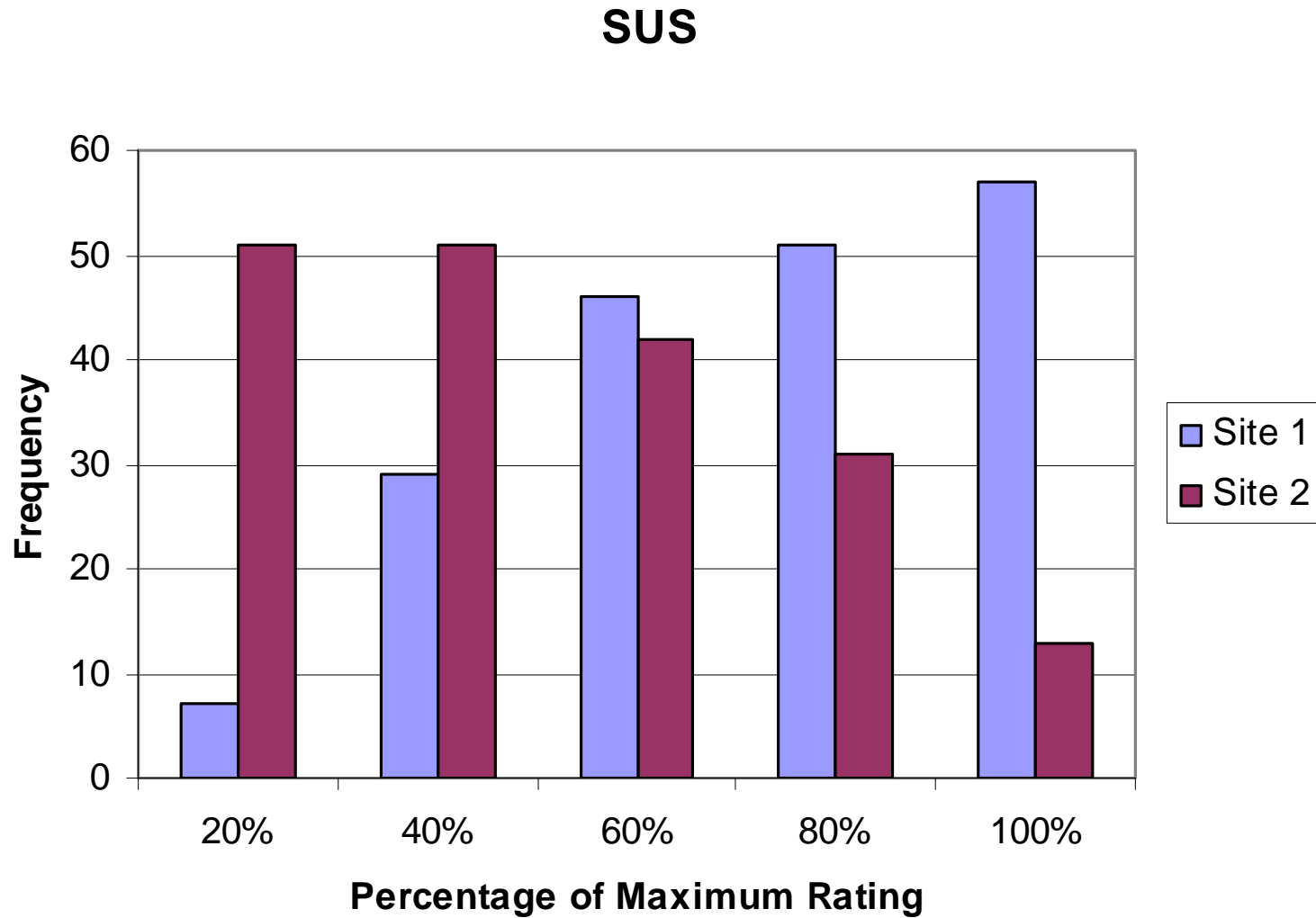
Data Analysis

- Special treatment for the “Words” condition since it did not involve rating scales:
 - Before the study, we classified each of the words as being “Positive” or “Negative”.
 - Not grouped or identified as such to the participants.
 - For each participant, an overall score was calculated by counting the total number of words that person selected and then dividing that number into the number of “Positive” words chosen.
 - If someone selected 8 positive words and 10 words total, that yielded a score of 80%.

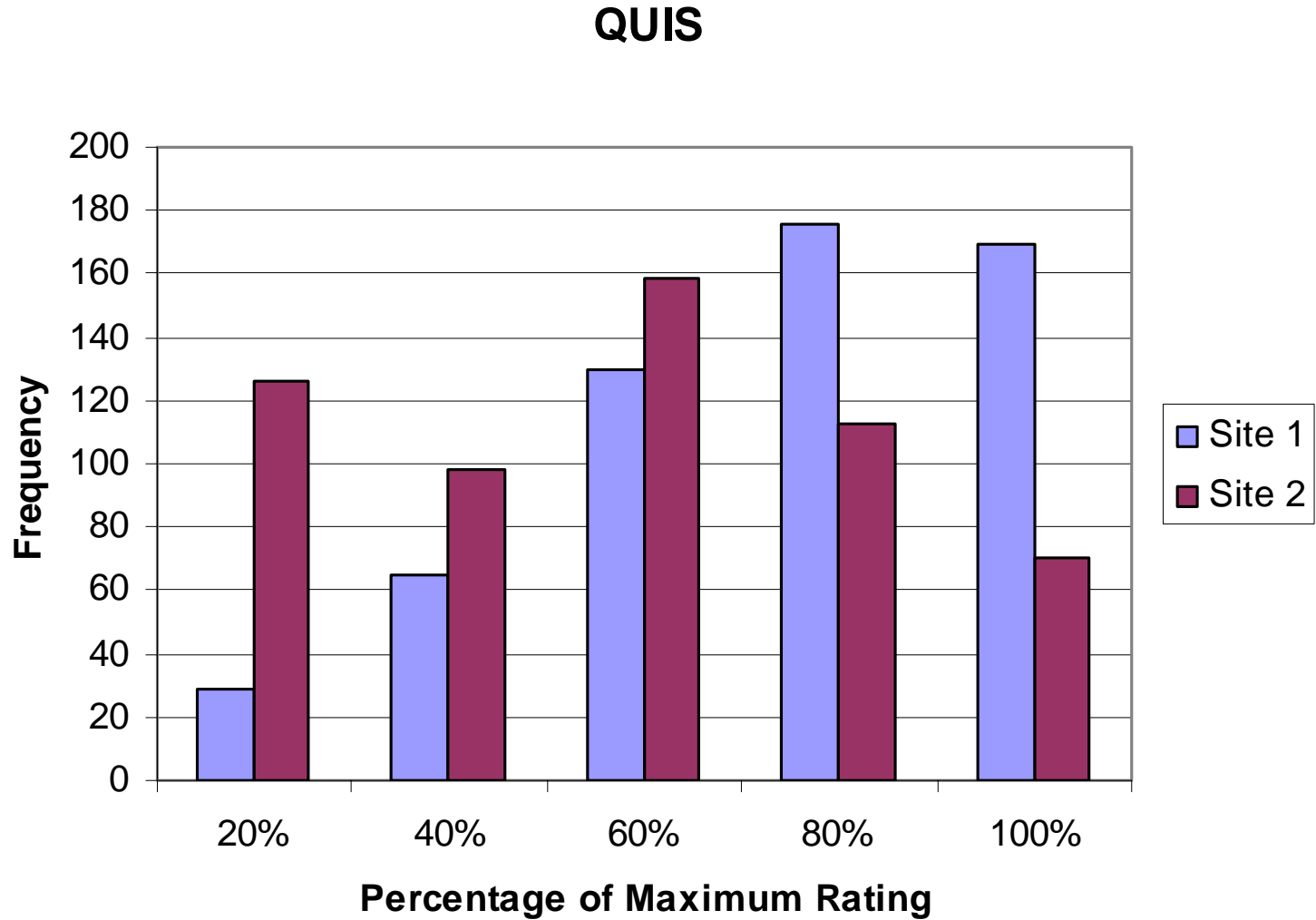
Results

- Calculated frequency distributions for the ratings, converted to percentages, for:
 - Each questionnaire
 - Both websites

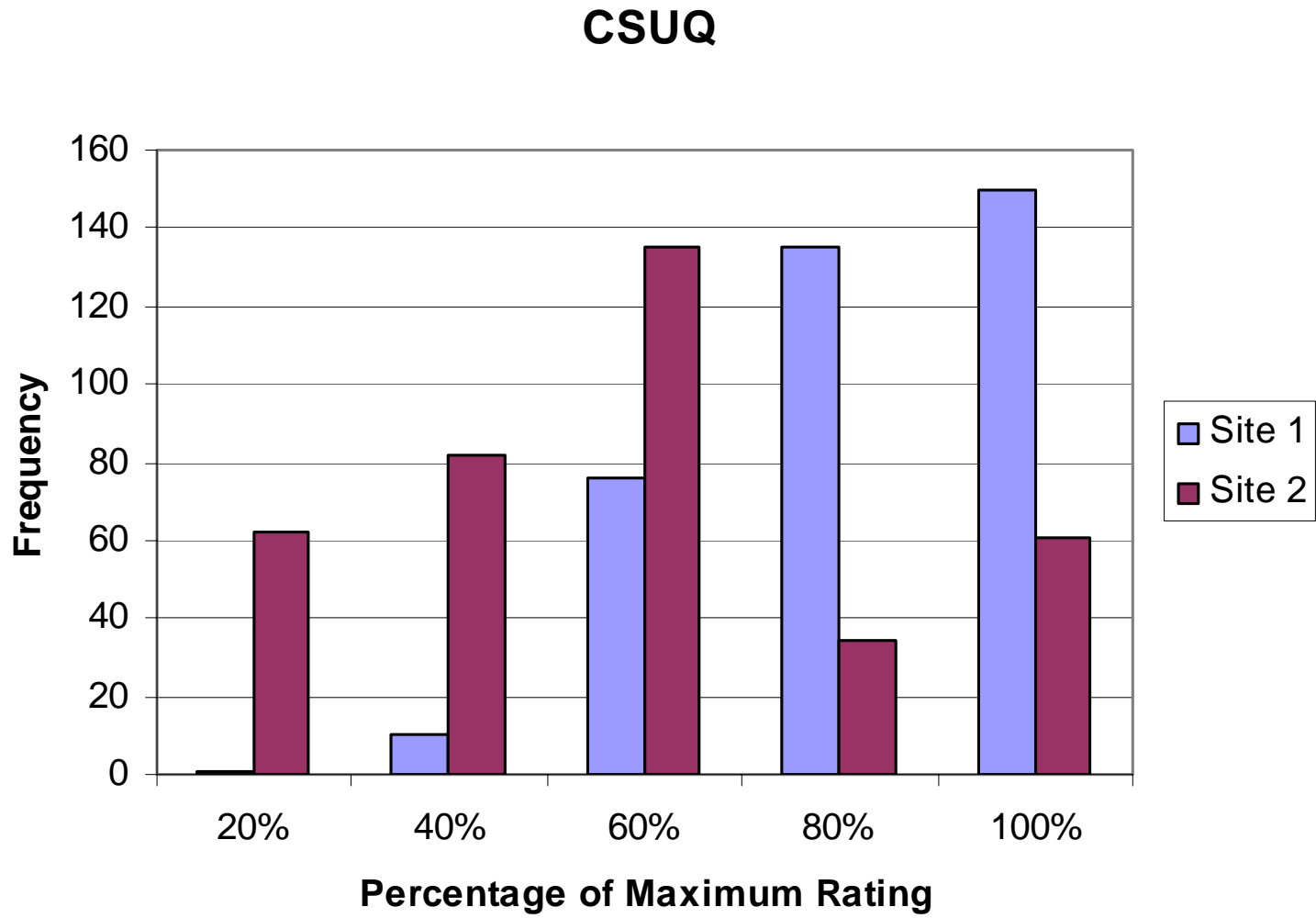
Results: SUS



Results: QUIIS

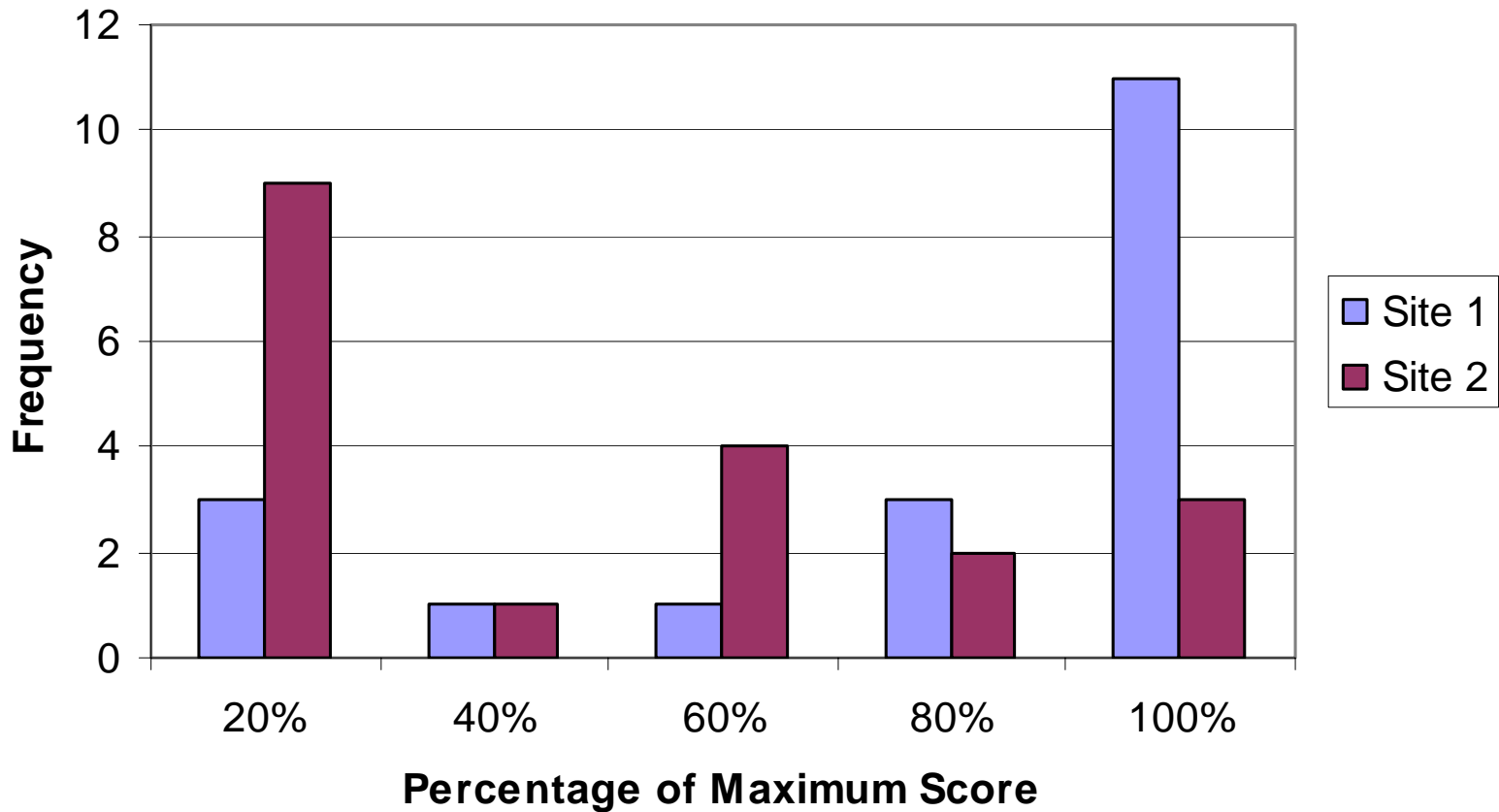


Results: CSUQ

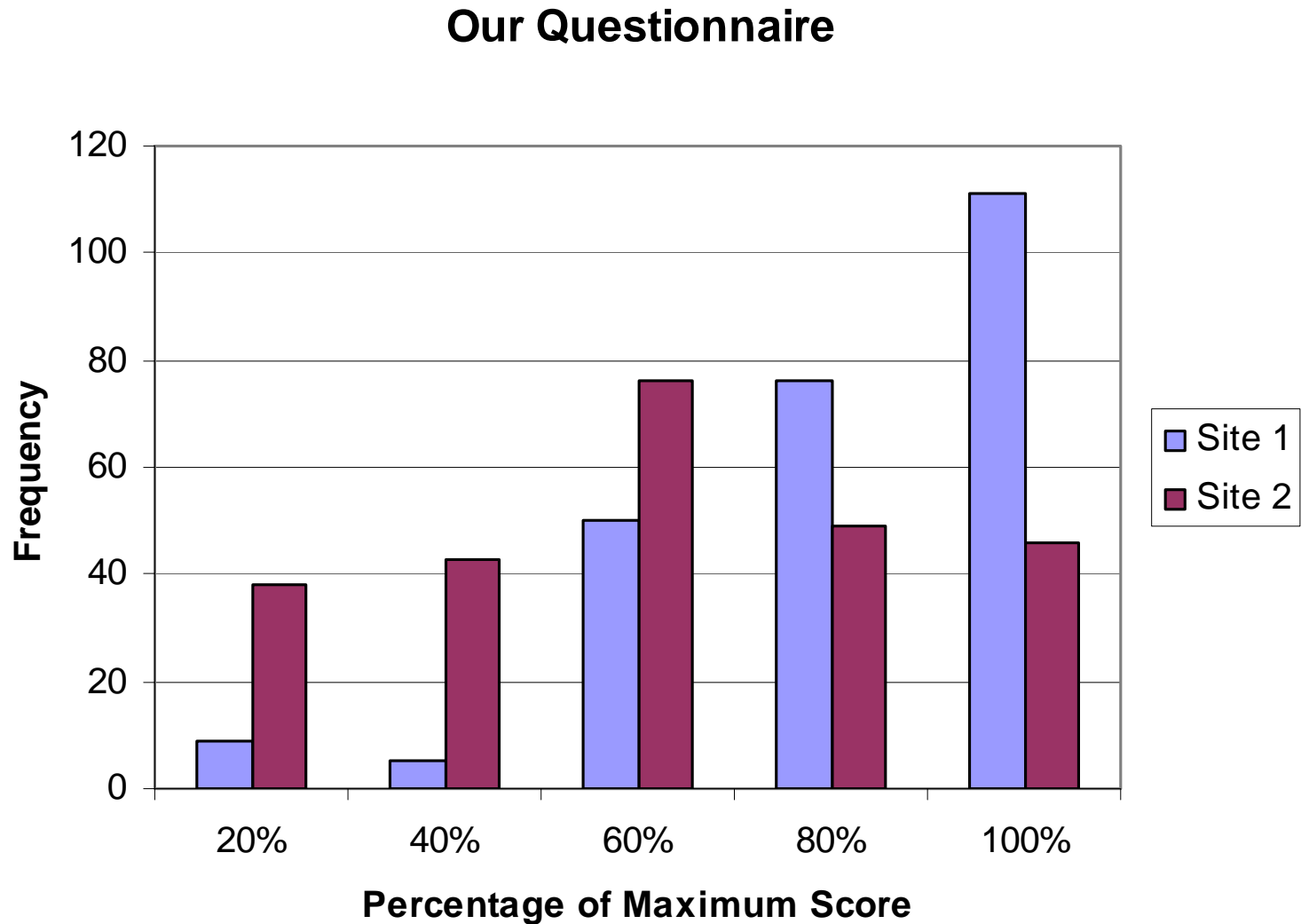


Results: Words

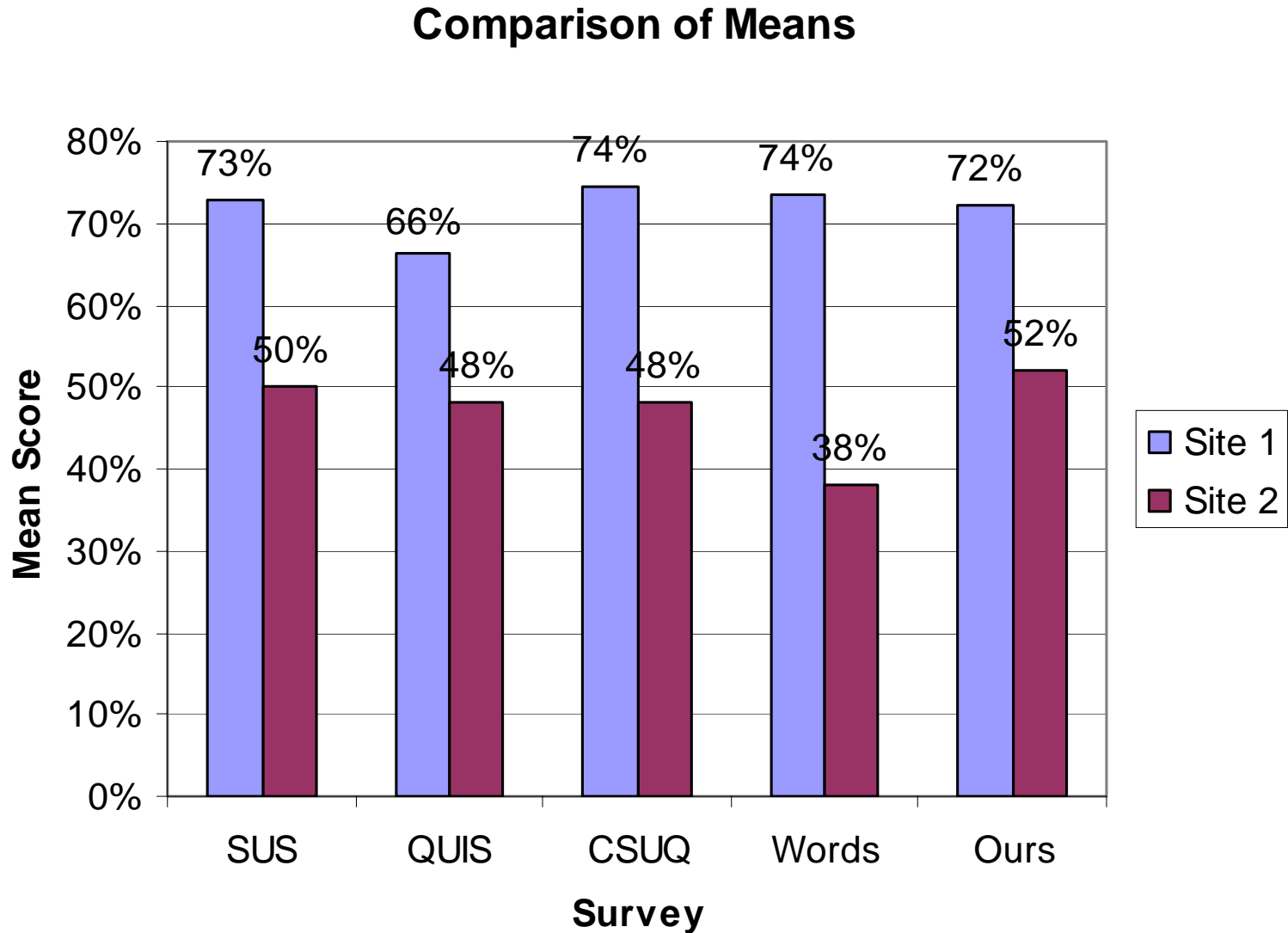
Survey 4: Words



Results: Our Questionnaire



Results: Averages



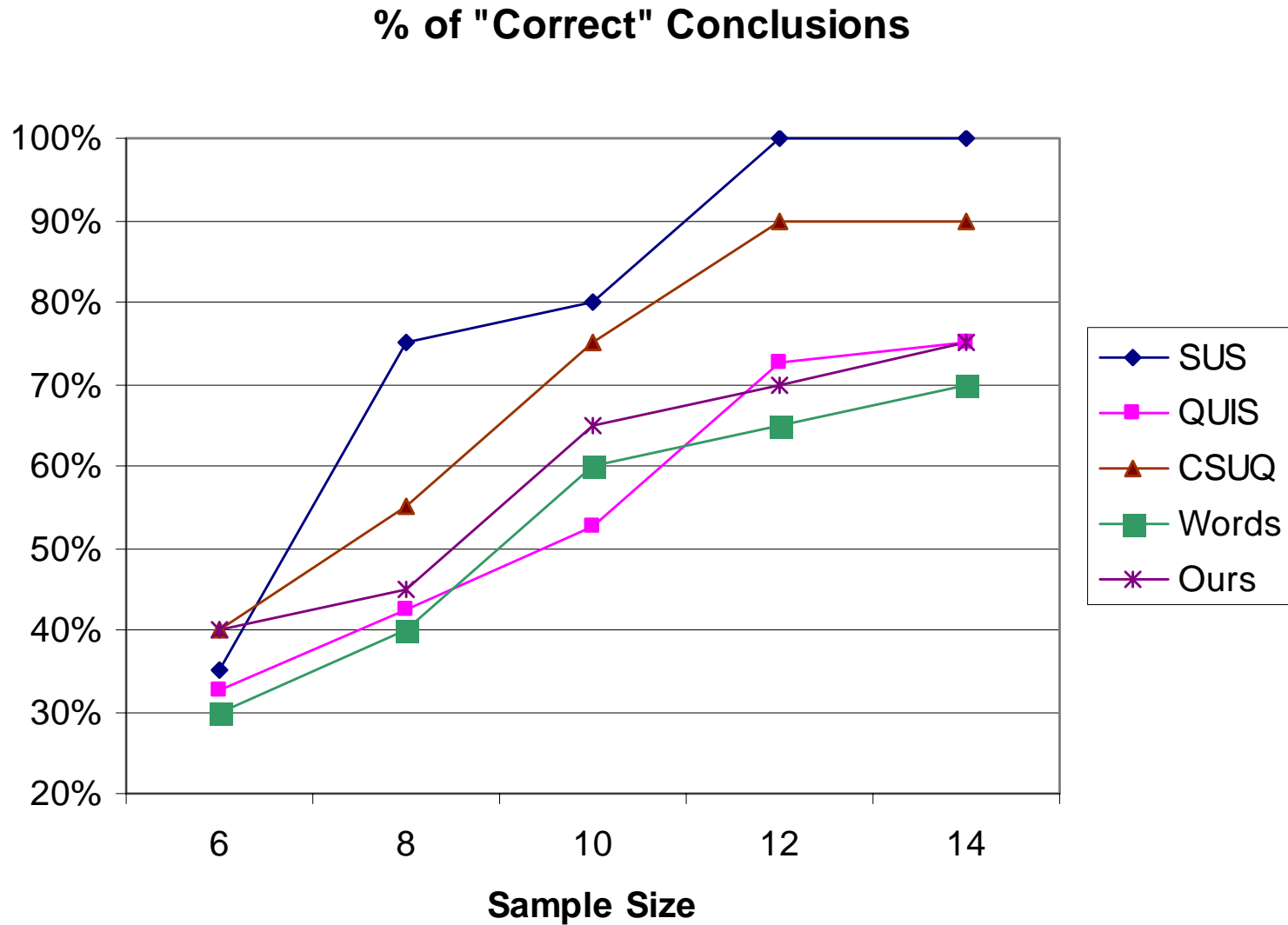
Results: Summary

- All five questionnaires showed that Site 1 was significantly preferred over Site 2 ($p < .01$).
- The largest mean difference (74% vs. 38%) was found using the Words questionnaire, but this was also the questionnaire that yielded the greatest variability.

Analysis of Sub-samples

- Next we analyzed randomly selected sub-samples of the data at size 6, 8, 10, 12, and 14.
 - 20 random samples for each size
- For each sample, t-test was conducted to determine whether the results showed that Site 1 was significantly better than Site 2 (the conclusion from the full dataset).

Analysis of Sub-samples



Analysis of Sub-samples

- Accuracy of the results increases as the sample size gets larger.
- With a sample size of only 6, all of the questionnaires yield accuracy of only 30-40%
 - 60-70% of the time, at that sample size, you would fail to find a significant difference between the two sites.
- Accuracy of some of the questionnaires increases quicker than others.
 - SUS jumps up to about 75% accuracy at a size of 8.

Caveats

- Results were undoubtedly influenced by:
 - The sites studied.
 - The tasks used.
- We have only addressed the question of whether a given questionnaire was able to reliably distinguish between the ratings of one site vs. the other.
 - Often you care more about how well the results help guide a redesign.

Conclusions

- One of the simplest questionnaires studied, SUS (with only 10 rating scales), yielded among the most reliable results across sample sizes.
 - Also the only one whose questions all address different aspects of the user's reaction to the website as a whole.
- For the conditions of this study, sample sizes of at least 12-14 participants are needed to get reasonably reliable results.