



Technical Communication
University of Washington

Conducting Remote, Internet-Based Experiments on Web Design

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Designing the Future of Communication

Overview

- ❖ Background
- ❖ Our Study
- ❖ Our Toolkit
- ❖ Going Forward

Background

- ❖ Health information increasingly online
- ❖ Often haphazard!
 - Long-article formats
 - Merged with existing content
- ❖ Little empirical research on navigation and comprehension

Relevant Research

- ❖ TOCs help develop schema for single-page articles online
- ❖ Applying TOCs to multi-page articles?

Our Primary Hypothesis

- ❖ Better comprehension if the site:
 - Explicitly cues article structure
 - Explicitly differentiates article structure from global navigation structure

Study Method: Article

- ❖ Adapted from a UW Web site
 - UW Orthopaedics and Sports Medicine
 - Knee replacement surgery technique
 - Long: 8,500 words across 8 pages
 - Left-hand navigation combined with intra-article “next” and “previous” links
- ❖ Chosen for high traffic and ratings

Study Method: Article

The screenshot displays a web page for UW Medicine, Orthopaedics and Sports Medicine. At the top right, there is a navigation bar with links for Home, Site Map, Contact Us, Links, and News. Below this is a search bar with the text "Type your question here..." and a "Search" button, with a link for "Advanced Search" below it. On the left side, there is a vertical navigation menu with the following items: Home, Patient Information, Our Surgeons & Faculty, Offices & Locations, Residency / Fellowship, Our Research, About UW Orthopaedics, and Support Our Mission. A "Logon" link is located below the menu. The main content area features a breadcrumb trail: Home << Our Surgeons & Faculty << Our Surgeons. The article title is "Minimally-Invasive Surgery (MIS) Quadriceps-Replacement: New Quad Sparing Technique May Protect Patients with Arthritis of the Knee. University of". The author is "Edited By: Seth S. Leopold, M.D." and the article was last updated on Thursday, June 09, 2005. A "Summary" section is present, with an "Overview" sub-section. The text in the overview states: "Knee replacement is a surgical procedure that decreases pain and improves the quality of life in many patients with severe arthritis of the knees. Typically, patients undergo this surgery after non-operative treatments (such as activity modification, anti-inflammatory medications, or knee joint injections) have failed to provide relief of arthritic symptoms. Surgeons have performed knee replacements for over three decades, generally with excellent results; most reports have ten-year success rates in excess of 90 percent." Below this, it begins to describe two types of approaches: "Broadly speaking, there are two types ways to insert a total knee replacement: the traditional approach, and the newer minimally-invasive (sometimes called quadriceps-sparing) approach."

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Study Method: Conditions

- ❖ Four variations on explicitness and placement of TOC:
 - Original local navigation
 - Original local navigation but labeled TOC
 - Explicit TOC
 - Global navigation + explicit TOC

Study Method: Conditions

Original

UW Medicine
ORTHOPAEDICS AND
SPORTS MEDICINE

Home

Summary

- Overview

Review of the condition

Considering surgery

Preparing for surgery

Minimally Invasive Total Knee Replacement:

Edited By: [Seth S. Leopold](#)

Summary

Overview

This article provides information about total knee arthroplasty using new minimally-invasive surgery (MIS) techniques, performed with a quadriceps-sparing surgical approach for the treatment of knee arthritis. This article summarizes the potential advantages and

Labeled TOC

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Explicit TOC

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Minimally-Invasive Surgery (MIS) Quadriceps-Sparing Total Knee Replacement: New Quad Sparing Technique May Provide Faster Recovery for Patients with Arthritis of the Knee

Edited By: [Seth S. Leopold, M.D.](#)

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Summary

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Global + TOC

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Study Method: Measures

❖ Survey questions:

- Demographics
- Perceptions
- Comprehension
 - 7 each factual and inferential

❖ Browsing behavior:

- Pages seen (unique and total)
- Time on pages
- Link type clicked

Study Method: Surveys

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Students: Jen Barrick, Sandy Bartell, Elisabeth Cuddihy, Brandi
Professor: Jan Spyridakis

Please answer the following questions

1) How **interesting** was the information you read?

- Very Uninteresting.
- Uninteresting.
- Neutral.
- Interesting.
- Very Interesting.

2) How **difficult** was the information you read?

- Very Difficult.
- Difficult.
- Neutral.
- Easy.
- Very Easy.

3) How **enjoyable** was the information you read?

- Very Unenjoyable.
- Unenjoyable.
- Neutral.
- Enjoyable.

- Intra-operative muscle tightness.
- Surgeon's lack of familiarity with the newer technique.

11) What life factor can affect one's likelihood of getting a knee replacement?

- Age.
- Fitness.
- Poor diet.

12) Which of these conditions is NOT considered a risk factor for knee replacement surgery?

- Carpal tunnel syndrome.
- Gout.
- Lupus.

13) Why is the MIS total knee replacement procedure preferred over traditional total knee replacement surgery?

- It is less traumatic to the muscles.
- The length of the incision is shorter than traditional total knee replacement surgery.
- The surgeon does not operate deeper than the muscles.

14) Right after MIS total knee replacement surgery, patients are instructed to take pain medication:

- Twice a day.
- Once a day.
- Three times a week.

Move to next section

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Final questions

I heard about this study from: (Check all that apply)

- A flyer.
- The UW Orthopaedics and Sports Medicine Web site.
- An online forum.
- An email list.
- A friend.
- Other.

I participated in this study because: (Check all that apply)

- I like volunteering.
- I like using the Internet.
- I am interested in Web site design.
- I am interested in arthritis.
- I or someone I know has (or may have) arthritis.
- I wanted to enter the drawing for a \$75 Amazon.com certificate.
- Other.

Please comment on any other aspect of your experience today.

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Study Method: Procedure

❖ Participants remotely:

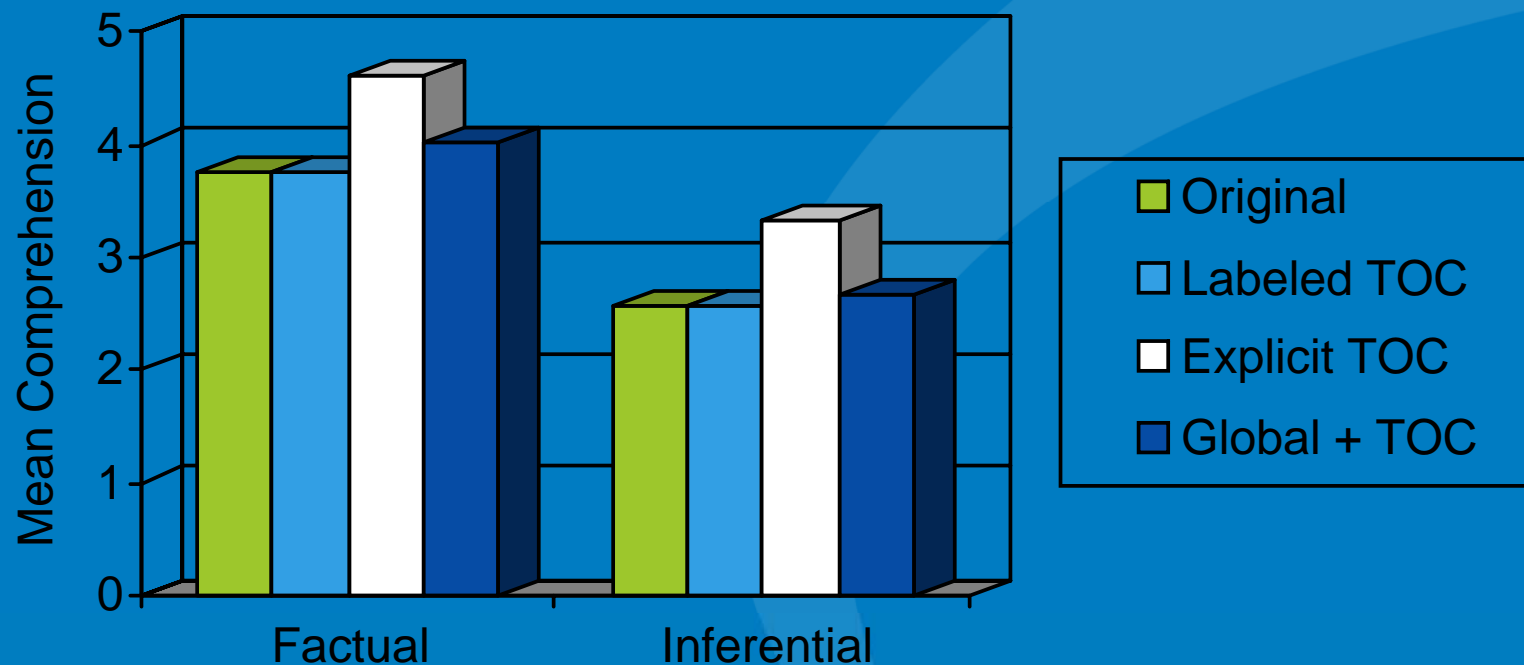
- Entered study when they wanted
- Consented and read instructions
- Completed a pre-survey
- Browsed article
- Completed a post-survey

Study Method: Participants

- ❖ Interested in health information online
- ❖ Phase 1: through forums and flyers
 - N ~ 170
 - Mostly female, well educated, mid-forties, native English speakers
- ❖ Phase 2: through actual live site (ongoing)

Study Results: Comprehension

- ❖ Significantly higher comprehension with explicit TOC versus original



Study Results: Perceptions

- ❖ No significant differences:
 - Perceptions of the site
 - Perceptions of knowledge gained in general or about knee arthritis
- ❖ But! Labeled TOC led to significantly greater perceptions of knowledge learned about knee surgery

Study Results: Navigation (Preliminary)

- ❖ No significant differences in preliminary navigation analysis:
 - 6 unique pages seen (mean)
 - 13 minutes spent reading (mean)

Study Results: Discussion (Preliminary)

- ❖ Explicitly differentiated TOC aids comprehension overall
- ❖ Readers' structural schema and comprehension are facilitated when intra-article navigation is distinguished

Shifting Gears: How We Ran The Study

- ❖ Work supported by a remote research toolkit we have been developing
- ❖ Remote research is difficult...
- ❖ But remote research is rewarding!

Toolkit Support: Materials

❖ Automatically...

- Generates conditions from single code source
- Sorts participants into conditions
- Generates integrated surveys from simple text files

Toolkit Support: Logging

- ❖ Includes many features of standard logs, identifying:
 - Where people come from
 - What pages they see in what order
- ❖ Includes much more! Including:
 - Tracking by ID instead of IP
 - Monitoring specific links clicked

Toolkit Support: Data Manipulation

- ❖ Web-based Excel data export
- ❖ Easy data import to SPSS, Access, etc.
- ❖ Post-processing to identify suspicious behavior

Demo!

And now, we enter the interactive part
of the program...

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Going Forward

❖ The future: this study

- Run actual site readers (ongoing)
- Analyze path data in more depth

❖ The future: our toolkit

- Continue to extend capabilities
- Adapt to other remote-research situations

For Further Information

- ❖ Presenter: Jen Barrick
laeren@u.washington.edu
- ❖ Faculty Advisor: Jan H. Spyridakis
jansp@u.washington.edu
- ❖ Web Site: Internet-Based Research
<http://depts.washington.edu/intres/>