

Ogio & Swiss Army Backpacks

Usability test report

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by:

Deborah Biggar

Paul Gokin

Kathryn Jurick

Nirali Patel

Jack Wu

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Introduction

Appearance and features are often used as primary selling points of backpacks, while usability is commonly overlooked. Ironically, improving ease of use can give backpack manufacturers a significant competitive advantage: increased revenue and more loyal customers by selling more products and reducing returns from customers who find the product's usability unacceptable.

The purpose of this diagnostic usability test was to identify the design strengths and weaknesses that have a significant impact on the usability of the following two backpacks:

- General purpose Swiss Army Backpack
- General purpose OGIO Backpack

The test sessions were carried out at the Bentley College usability lab. The user group, described in more detail in the Appendix, included people who regularly commute and use a backpack during their commute. A total of seven participants took part in the test, including the pilot. The participants were given a set of tasks to perform with each of the backpacks. Usability problems were identified based on our observations of the participants' performance and their comments while performing the tasks and answering questionnaires. Each problem found was rated according to the following scale:

Problem severity ratings legend

High

Problem always or almost always occurs. It is difficult to overcome the problem. The problem bothers the users once they know about it. The problem has a significant negative impact on the user's impression of the backpack.

Medium

Problem sometimes occurs. It is somewhat difficult to overcome the problem. The problem sometimes bothers users once they know about it. The problem has a slight negative impact on the user's impression of the backpack.

Low.

Problem rarely occurs. It is easy to overcome the problem. The problem rarely or never bothers users once they are aware of it. The problem has no negative effect on the user's impression of the backpack.

Executive Summary

Aspects and parts of the backpacks evaluated:

- General comfort, external pockets, interior subdivisions and compartments, straps, zippers;
- Ability to accommodate common items like books, laptop, water bottle, keys, pens/pencils, umbrella, etc.
- Capabilities handling common actions associated with:
 - Music player / headphones;
 - Cell phone.

Major findings

The most important positive findings come from users they were completing the tasks and answered the post-test questionnaires. The Swiss Army backpack got high marks for comfort. The Ogio received praise for interior organization and number and usefulness of pockets and compartments.

The major problems, grouped by backpack, are:

Ogio:

- there is not enough padding on the back and straps, making the pack flimsy and uncomfortable;
- the handle formed by the straps converging at the top of the pack created neck discomfort and prevented a snug fit;
- the straps were difficult to adjust;

- the laptop sleeve is too large and does not adjust to accommodate an average-sized laptop;
- the side pockets were too small to fit some of the items that the participants tried to place there;

Swiss Army:

- the mesh pocket's purpose was unclear; it's clips prevented easy access to the smaller, front pocket;
- the fabric flaps over the zippers consistently got caught by the zippers;
- there is no dedicated sleeve for a laptop;
- the CD player compartment does not have enough padding to protect the player from hitting against other items in the backpack;
- there are not enough pockets in general and no "easy access" outside pockets;

Both backpacks:

- the headphone hole is too tight for a standard headphone plug to pass through.



While these problems did not prevent any of the users from completing the test tasks, they caused many to find less than efficient workarounds. We believe that by addressing these issues, backpack manufacturers can make their backpacks more accommodating to how the users will want to use them.

Test findings.

Rating	Problem	Recommendation
High	Sturdiness: The Ogio backpack appeared to be flimsy. Participants noted that it was not as sturdy as the Swiss Army Backpack. The sturdiness of the Swiss Army appears to be from the abundant padding that increased comfort level for the participant. Participants mentioned that it was uncomfortable to walk with the Ogio Backpack on. This could be explained by the Ogio's lack of sturdiness and bulkiness.	Stiffen the back of the pack and add padding to the entire back including the lumbar region. Additionally, a layer of padding on the bottom ("floor") of the backpack would help protect fragile items (i.e. laptop) if set down abruptly.
High	Size: Capacity was one of the most important features rated by participants in the post-test survey; however, most participants noted that the Ogio Backpack was too big and mentioned that they could fit just as many items within a smaller backpack like the Swiss Army. Ogio's large size allowed for movement of items within the backpack creating a "bulky" feeling instead of a secure fit.	Make the pocket large enough to hold standard size items but not any larger. Alternatively, utilize Velcro and/or elastic more frequently to enable users to adjust items in pockets more snugly.
High	Straps: The straps which converged into a handle at the top of the Ogio bag caused neck discomfort for all/most participants. One participant commented that this feature constrained shoulder movement which added to the discomfort.	Omit this feature from the design. Attach the individual straps directly to the back of the backpack.




Rating	Problem	Recommendation
High	Straps: Participants noted that the straps on the Ogio backpack were not comfortable and that the straps on the Swiss Army were comfortable due to the extra padding in the straps.	Make sure the straps have sufficient padding. Use the Swiss Army bag's strap padding as a model.
High	Straps: During the pretest survey, over half of participants mentioned that comfort was the most important feature of a backpack. Two participants during the test utilized the chest straps provided in the Ogio backpack. Neither backpack had a lumbar strap.	Since comfort is a very important feature, both adjustable chest and lumbar straps should be provided as they have a significant effect on comfort. Lumbar strap would also provide more stability on the hips and keep the pack from bouncing around.
High	Zippers: Zippers continued to get stuck on the fabric primarily with the Swiss Army Backpack causing frustration for the participants. The zipper track on the Swiss Army was not as strong as the zipper track on the Ogio. Participants mentioned that the piece of fabric that would cause the zippers to get stuck on the Swiss Army was probably there to prevent water from entering the backpack.	Remove fabric flaps above zipper and, if possible, make zipper itself watertight. Prevent bunching or folding of fabric near zippers so it won't get caught in the zipper.
High	Cell Phone Pocket: Time on task for accessing the cell phone was shorter for the Ogio than the Swiss Army. Even though the Swiss Army backpack had a specific pocket for cell phones (which was located inside the front, small compartment), participants preferred the Ogio backpack because it had more accessible pockets. Because of the accessibility of the side pockets on the Ogio, a few participants did not have to take off their backpack to access their phone. On the other hand, not only did they have to take off the Swiss Army backpack, they also had to "dig" inside the front compartment.	Participants rated cell phone pocket/placement one of the most important features of a backpack. We recommend placing a cell phone pocket on the front of one of the straps to make the cell phone easier to reach quickly. This placement will also improve the users' ability to hear the phone ring or feel it vibrate.

Rating	Problem	Recommendation
High	<p>Laptop Sleeve: Participants were disappointed that a laptop sleeve was not included within the Swiss Army Backpack. Even though they were appreciative of the laptop sleeve within the Ogio, participants were not able to securely place the laptop within the laptop sleeve of the Ogio bag because the laptop sleeve was too big and the strap to secure the laptop was too short.</p>	<p>Ensure that there is a laptop pocket with a long strap that can adjust to varying laptop widths.</p>
Medium	<p>Music Management: Within the Swiss Army backpack, participants were concerned for the safety of the CD player and the laptop because they would hit against each other.</p> <p>In addition, the placement of the CD player pocket within the Swiss Army backpack prevented the participant from easily accessing the pocket since the other items within the big compartment were in the way.</p>	<p>Provide more padding between these two pockets to protect and stabilize items. Alternatively, place the pockets far enough from each other to prevent them from coming into contact with each other.</p> <p>Consider placing the CD player pocket in a more easily accessible area. Users should be able to access the music device directly and not through another compartment.</p>
Medium	<p>Music Management: In both backpacks, the audio port hole, which the headphone wire would run through, was too tight. Nearly half of participants were not able to weave the wire through the hole.</p> <p>Ogio:</p>  <p>Swiss Army:</p> 	<p>Make hole flaps slightly more flexible to allow headphone plug to pass through the hole. If this would cause the pack to be less waterproof, redesign the headphone hole to allow for easy pass-through while keeping it watertight.</p>

Rating	Problem	Recommendation
Medium	<p>Side, Zippered Pockets: In the Ogio backpack, almost half of participants chose to place the water bottle or umbrella into the side zippered pockets but were unable to do so because either (a) those pockets were too small or (b) the fit was so tight that the participant could not to zip the pockets shut.</p>	<p>Make side pockets a bit larger to enable users to place items the size of a small umbrella inside and to make it easier to zip up those pockets.</p> <p>Alternatively, place a flexible / expandable pocket on the side. It would provide a place to put odd-sized items, keeping them within easy reach and away from other items that might get wet.</p>
Medium	<p>Key Hook: Many participants did not see the key hook within the Swiss Army bag because the hook was so small. Most did find the longer key hook within the Ogio and liked that feature because they knew exactly where their keys should go. They liked that the keys wouldn't get lost within the backpack.</p>	<p>If a key hook is included, make sure it's prominent / visible enough that people can find it easily. Those customers for whom a key hook is important may not want to buy the product because they can't find the hook.</p>
Medium	<p>Mesh: Participants did not know what the front mesh pocket was for. They mentioned that if they did place something inside of the mesh (ex: umbrella or water bottle), they were afraid it would fall out. Since the mesh prohibited the user from easily accessing the smaller, front compartment, it got in the way for participants. Some participants simply forgot to strap up the mesh pocket. When they put on the backpack, they didn't realize that the mesh was flapping around which could be potentially dangerous or lead to lost items.</p>	<p>Either omit the mesh pocket and add side pockets or move the pocket fasteners so that their use is not mandatory when accessing the smaller front pockets.</p>



Rating	Problem	Recommendation
Medium	Straps: The straps on the Ogio backpack were not easily adjustable. Most participants noted how they really liked the “parachute hooks” (plastic loops that sealed the ends of the straps) on the Swiss Army which allowed them to easily adjust the straps (see the image above)	Add loops to the bottom of straps to foster easy adjustment of straps and to prevent straps from accidentally falling through fastener.
Medium	Straps: The straps on the Ogio Backpack tended to twist when participants put on the backpack onto the second shoulder.	Make sure the straps have sufficient padding. This would make the straps sturdier and prevent them from twisting. Secure attachment between the top of the strap and the backpack would also help.
Medium	Number of Pockets: Participants did not like the limited number of pockets on the Swiss Army (2 pockets) as opposed to the Ogio (8 pockets). The additional pockets on the Ogio allowed participants to separate items, and the pockets on the side allowed for easier access. On a post-test questionnaire, all participants selected the Ogio for organization by a wide margin.	Provide multiple pockets in varying sizes, especially “easy access” outside pockets.
Medium	Front, small compartment: The small compartment at the front of the Ogio bag was too shallow. Participants were afraid that items would fall out of it when open. On the other hand, the front, small compartment for the Swiss Army Backpack was too deep and participants tended to “lose” things inside the compartment.	<p>Make pocket approx 1:1 ratio in width vs. depth, or alternate colors inside to provide more interior contrast. This would make individual smaller pockets easier to notice.</p> <p>Make sure the zippers don’t extend all the way to the bottom of the pocket. This would keep the pocket flap from opening completely, preventing its contents from falling out.</p>

Rating	Problem	Recommendation
Low	<p>Zippers: Participants did not like the fabric zipper pulls on the Ogio backpack (left picture below). They did like the look and feel of the zipper pull for the Swiss Army backpack (right):</p> 	<p>Re-design with larger, sturdier zipper pulls with better grip.</p>
Low	<p>Material: Participants commented that they did not like the material used for the Swiss Army backpack and that they preferred the more durable material of the Ogio.</p>	<p>Use material that feels strong and durable. Customers for whom this is important may shy away from purchase based on this alone.</p>
Low	<p>Music Management: Few participants who were able to fit the head phone wires through the audio port hole, did not like that the hole was on the right <i>side</i> of the Swiss Army backpack. Ogio's audio port hole was at the <i>top</i> of the backpack. The participants mentioned that they felt more comfortable with this placement because they wouldn't get twisted up in the wires and they had the flexibility to determine which side of their head the wire should come around.</p>	<p>Make sure the audio port hole is situated at the top-center of the backpack.</p> <p>Consider headphone needs for both storage and comfort/accessibility while wearing</p>
Low	<p>Music Management: For both backpacks, participants didn't feel comfortable in putting the CD player within the same pocket as the headphones. This could be due to the size of the pockets provided for these items.</p>	<p>Adjust the size and location of pockets to accommodate the CD player and at least a pair of small "ear bud" headphones.</p>

Rating	Problem	Recommendation
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Low

Music Management: Participants were unable to fit the CD player and/or headphones in the designated compartment within the Ogio bag. While this annoyed the participants, they were able to come up with alternative solutions. Participants did appreciate the soft interior of this compartment because they believed it would keep their CD player from getting scratched.

Since Music Management was rated by participants as the least important backpack feature in general, it may not be necessary to include a separate pocket for CD players. In addition, users may be using much smaller music devices like iPods. In this case, pockets for small music devices should continue to have soft interiors to prevent scratches and be as accessible as the cell phone pocket.

Additionally, since the participants praised the soft interior, we recommend including a less specific, generously padded pocket for “delicate” items.

Low

Symbols: For both backpacks, even if the participants noticed the symbols throughout the backpacks, they didn’t necessarily follow them. In a couple of cases, participants didn’t know what the symbol meant. Participants made their own decision on where items should be placed rather than follow the symbols. For example, most participants did *not* place the cell phone into it’s “designated” pocket within the Swiss Army backpack.

Since the participants didn’t use the symbols to decide where to put things, we would recommend that the development team *not* spend their time, money, and efforts in designing symbols.

Ogio:



Swiss Army:



Appendix A: Test Method

Recruiting the Participants

Qualifications of the Test Participants:

- Must have never owned/used either of the two brands (Ogio or Swiss Army)
- Must use a backpack four or more days a week
- Must commute regularly
- Should often carry more than 6 items within their backpack such as laptop, cell phone, books, important notes/map/directions, gym clothing, CD player, music, food, water, keys etc.

Recruiting methods used:

- Posting flyers in several locations on campus offering a Starbucks gift card for 2 hours of help with a backpack usability study;
- Asking qualifying friends to participate.

Screening protocol used:

- Potential participants were either asked to fill out the Recruiting Screener (sent over email or printed);
- Or were screened verbally by answering qualifying questions.

Preparing for the Test

The following checklist was used at the start of each day of testing:

- both backpacks are in perfect working order and are clean
- all of the items to test with the backpacks are accounted for and are ready to go
- the test room is properly set up
- the note-taker(s) have paper/pens ready
- the following forms and documents are ready:
 - the release form
 - the pre-test questionnaire
 - the tasks/scenarios
 - the post-backpack questionnaires
 - the post-test questionnaires
 - the Starbucks gift card

The testing procedure

Before each participant arrived:

- the backpack was unloaded and its zippers and straps returned in the initial “start of test” state
- all backpack items were collected and arranged in their “start of test” state (see appendix C)

During the session:

- start recording
- bring the participant into the test room (ask them to turn off their cell phone, and keep their coat with them)
- give the pre-test introduction
- reassure the participant that:
 - the backpacks are being tested, not the participants;
 - the participant has the right to stop / withdraw without penalty;
- ask the participant to read and sign the release form
- demonstrate thinking aloud using a cell phone and have the participant practice using a CD player
- ask participant to fill out pre-test survey while thinking aloud
- give the tasks, each on a separate piece of paper, stapled together
- ask the participant to read each task aloud before performing it
- if necessary, remind the participant to continue thinking aloud
- once the last task is complete, ask the participant to fill out the post-backpack questionnaire
- once the second backpack is tested, ask the participant to answer post test questions and to fill out the post-test survey
- thank the participant and give him/her the gift card
- stop recording

Tabulating and analyzing the test data

- five test administrators were involved in the study. The roles of administering the test, facilitating with the participant, and taking notes were rotated with each test
- each of the note takers transcribed their handwritten notes, making sure to keep their observation and user comments separate
- one of the administrators compiled the data for all seven participants—including the pilot—by tallying responses from questionnaires and identifying key comments from the tasks
- as there were no task failures and task time was not a critical measure for most of the tasks no statistical analysis was performed on these raw measures
- in identifying problems, all the administrators met to discuss and reach an agreement on each identified problem and its severity level
- the administrators met to come up with recommendations for each problem that was identified

Appendix B: Task list

The tasks used in the test

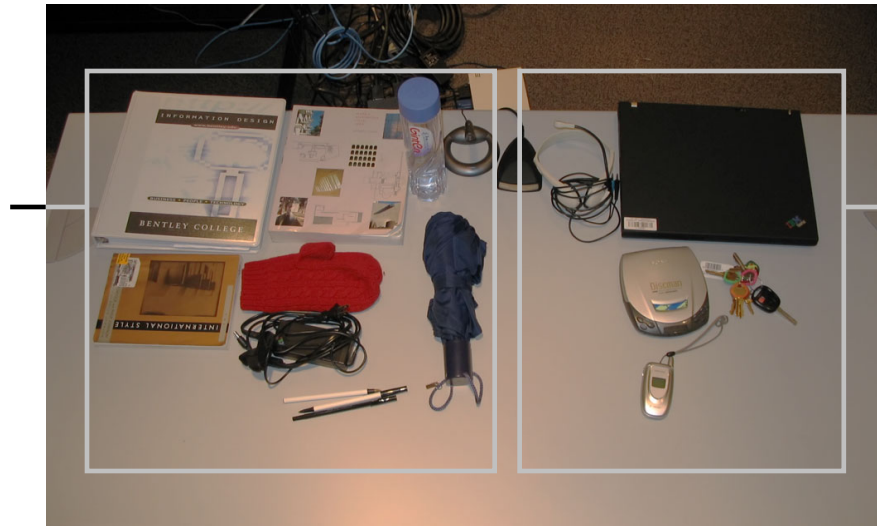
1. Familiarize yourself with the backpack.
- 2a. A number of items are placed on the table. Along with the five items already chosen, choose at least three additional items you carry most often and place them all into the backpack.
- 2b. Put the folded piece of paper labeled "Task 4" in the backpack, but in a handy place for easy access later.
3. Put on the backpack.
- 4a. Take out the folded piece of paper labeled "Task 4" and follow the directions.
- 4b. [Task 4 Directions:] You're going for a short walk inside the building. Please follow the facilitator. Continue to voice your thoughts.
5. This is a timed task. Pretend that your cell phone is ringing. Please answer it as quickly as possible. The timing will start as soon as you finish reading this sentence.
6. Place the umbrella (on the table) into the backpack.
7. Set up the CD player with the headphones so you can begin listening to Track #1. Put on your coat, then put on the backpack.
8. Forward to track 3 on the CD player.

Appendix C: Test Setup and Backpack Photos

These were the additional items the participants could choose from:

Binder, big book, small book, water bottle, mittens, pens & pencils, laptop power supply.

The umbrella was a required item for task #6.



All participants were required to place these five items into the backpack:

Laptop, CD Player, headphones, cell phone, and keys.

The Swiss Army backpack (left) and Ogio (right):



Appendix D: The cell phone task times (task #5)

Backpack \ Participant	1	2	3	4	5	6
Ogio	:04	:09	:07	:10	:08	:13
Swiss Army	:11	:17	:03	:07	:18	:09

Appendix E: Post-test questionnaire responses

Post-test preference questionnaire responses

Each “x” represents a “vote” from a single participant

	Ogio	Swiss Army	Neither	Both
Cell Phone Access	xxxxx		x	x
Music Management	x	xxx	x	xx
Interior Organization	xxxxx			xx
Zippers	xxx	xx	x	x
Comfort	x	xxxxx		x
Preferred Design?	xxx	xxxx		

Post-test feature importance questionnaire responses

The rightmost “total points” column contains the “weighted” importance score for each feature. The score was calculated by multiplying the number of responses by the point value (1-5) for each feature.

Aspect / Feature	1 Not Important	2 Not Very Important	3 Somewhat Important	4 Pretty Important	5 Very Important	Total Points
Waterproof				16	15	31
Capacity			3	12	15	30
Cell Phone pocket or placement			3	12	15	30
Zippers or Other Fasteners			6	8	15	29
Number of Pockets		2	3	8	15	28
Size of Pockets			6	12	10	28
Laptop Placement		2	6		20	28
Color		4	9	8		21
Music Management		6	6	8		20
Other Features?*						
Material					5	5
Size Overall					5	5
Appearance					5	5
Outside Pockets					5	5
Padding					5	5
Shoulder Straps					5	5
Cost				4		4

* The items listed under "Other Features" were the one that the participants volunteered themselves when asked whether any additional features were important to them.

Important insights and lessons learned

(Not a part of the report submitted to the client)

- It was hard to test the immediacy of the cell phone task without the cell phone actually ringing. We had to make this trade-off (a) for the ease of testing and (b) because the cell signal in the downstairs lab was poor/unreliable.
- The headphones used in the test were larger than “normal,” had a microphone attachment, and a dual plug. These features may have made it more difficult for the participants to complete the headphone-related tasks.
- Not all of the participants brought a coat to the lab. Some participants were able to complete the tasks that required them to have a coat on, while the others performed these tasks without a coat. This may have influenced the results for the tasks that involved a coat.
- Some tasks had subtasks. Had the tasks been broken up into smaller tasks (with no sub-tasks) it would have been easier for the note-taker to mark the task start and end times.
- All of the participants ranked “waterproof” as a pretty or very important feature. Through our experience outside the lab we knew that the Swiss Army backpack wasn’t waterproof, but the participants were not aware of this. Letting the participant know this fact may have influenced their preference rating.
- The post-test feature importance survey was administered at the end of the test. Had the participants been asked to rate their preferences before using the two backpacks, their responses might have been different. That is, their experience with the backpacks in the test may have influenced their answers on the questionnaire.
- Even though the tasks wording was altered slightly after the pilot session, we counted the pilot as one of the participants. Since this is a diagnostic test, we felt that using the pilot results was acceptable.