D Transcripts

Each participant in this study was videotaped during the Tutorial and the Exercises. All of the later users were also audiotaped during the Debriefing. This appendix contains partial transcripts of these sessions. Only those portions of the sessions considered interesting were transcribed. In particular, large segments of the sessions containing only the user reading verbatim from the script were omitted. Other segments of the sessions were paraphrased. The times provided in the leftmost column are approximate. The tables below use the following notation:

Notation	Meaning
Normal Font	Indicates verbatim of the participant.
Bold Font	Indicates verbatim of the experimenter.
Underlining	Indicates speaker's emphasis.
"Quotation"	Indicates verbatim of the script (Tutorial or Exercises).
(Parenthesis)	Indicates transcriber's uncertainty over verbatim.
Italics	Indicates a note from the experimenter.
[Square Brackets]	Indicates a note from the transcriber.
Das–	Indicates user stopped speaking in the middle of an utterance.
~42	Indicates user's comment contradicts the numbered comment.
42	Indicates problem addressed for later users.
{42}	Indicates a problem implied by user's comment, or a situation where user would have benefited from suggestion described by numbered comment.
:	Indicates verbatim continues, but has been omitted.
Harry / Harriet	Indicates the experimenter using the participant's name (name changed to protect participant's anonymity).

The organization of this Appendix is alphabetical by participant identification number. The chronological order of the participants was: P1, P2, P3, P4, P5, N1, E1, S1, E2, N2, N3, E3, N4, and C1.

D.1 C1

Participant C1 was one of my committee members. He volunteered to participate in my usability test to better understand the problem, my interface, and the study. During the course of his run, I interact with him more than would normally be appropriate. I did this for two reasons. The first is that we needed to complete the Exercises and Debriefing portions of the study by a certain time. For this reason, these two segments of the study were done in parallel. The second is that the purpose of our work was to familiarize him with my thesis work. As such, I felt that it would be appropriate to stop him and explain what was happening, rather than have him struggle through a known problem.

D.1.1 Tutorial

Time	Transcript	ID
5:00	[Introduction7] Hmm. Now this is confusing me a little bit, or it seems much too subtle to me that, that in fact, that the difference between things is whether one wants to transmit or receive– just haven't thought about it that much.	
	[Moves Tutorial screen; clicks "OK"; the next window appears in the SE corner]. Ahh. [frustration]	1
8:20	["Please double-click on the 'Control Panel' indicator light."] Hmm. Indicator. I don't know where the indicator light is. "Please… double-click… on the Control Panel indicator light." I think I've got it already. "The 'Control Panel' window should soon appear on your screen. You should see a list of folders… tabs across the top of the window." [double-clicks] OK. I get it.	111
10:20	[Somewhat color-blind.] OK. So Normal is forest green… Ah… So I don't have any forest green. Warning is gold. So, I can tell these… pretty well, but let me… see what alternatives I have here. Orange Red. Dark Orange. Yeah, that's a little better fer, better for me. Or is it? Well, I think what I'll do… I'm going to change this so that, ah, Normal is just White. And Warning is Yellow. And Critical is Orange Red. OK. Now those are three that I can really tell the difference. OK.	
	[Tutorial says "green", but the user was using "white".]	106
15:00	["Let's look at the last main section, the one labeled 'User Data'". User rereads this instruction in Task3.]	
	Oh, ok. So those are subtasks. The programs you need to– so I guess the subtasks was just sort of a recursion going on here.	222 211
18:00	Oh. OK. So I just finally realized that the "predefined" things are things that are already there, or, or, that I, that I have a choice of, and things on the right so I get to drag things over or something, I guess, when I really want to define something. Hmm. I didn't understand that at first.	223

19:00 **Is the mike okay?**
Oh, sorry.
That's okay. It's easy to knock off.

20:30 Is set to none… I wonder what it means I'm not able to look at the directory, the contents or any of the children. Maybe that means it won't be hoarded. Who knows? 281

21:55 OK. So, he– we choose "all descendants" of thesis, but only immediate children of thesis. Nah this is beginning to worry me a little bit because I think I would tend to choose "all descendants" all the time, just to make sure I got all the stuff, so um, I'm just thinking if this really were my thesis it seems unlikely that I wouldn't want all of it all the time whereas if, if I'm off in some library, a set of libraries or something, then I definitely wouldn't want all of it all the time. In any case, I don't see, I don't see much value in just hoarding– I see kinda only marginal value of hoarding any particular directory unless I'm hoarding some of the stuff under it. Oh well. 113 58

Oh. Wrong <Enter>. Hit <u>that</u> <Enter>. [Numeric keypad <Enter> vs. <Return>– equivalent <Enter>.] 282

26:10 In real life, I would call this "proposal". And then you type <Enter>. 35
So, I'm going to stop– You're about to have a problem. Um.. When I say, feel free to make some up, it means use whatever path.. pathnames come to mind– not fake ones.
<u>Not</u> fake ones.
It should be real directories.
Ah, oh. OK.
Peopl–
You mean I should choose one that…
So, so for instance [mumble] Um… So one of the usability problems is that it gives you no feedback if that directory doesn't exist.
Right.
OK. Um, and, so that you don't run into– so that you don't spend a lot of time fighting this problem, I'm just going to come in and tell you. So if this, if this doesn't exist, (then) it thinks its a file.
Uh– OK.
So, for instance, if we go, I'm gonna just change this a little. OK. 'Cause this is ta–, just for you to test.
Yeah.
And then I'm going to hit <Enter>.
Yeah.
And then it enabled all that meta-information.
Ah.
This– this has to be a <u>real</u> directory.
Alright.
It can be <u>any</u> directory. It could be /tmp.
OK. Alright.
When I said feel free to make some up, what I meant was pick any, you know, pick /tmp– not <u>literally</u> make up directories.
Ah. OK. Alright.
It was a bad instruction.

35:50 [TaskUnavailable causes system to beep three times.]
Ew. So. Repeat for hacking advice. Oops! Didn't want to do that. Back. And go down here and click the right button. And there is number 2– hacking advice. So now it's got that. Hmm. A Task is red. And these things are red. So, I wonder what this means– This means that… I wonder what the red bars and 90% means. Red means it's in trouble. And maybe it means that 90% of the stuff has <u>not</u> been hoarded yet. 268

	OK. Well. I see– I see that, but I guess, I, now I'm wondering why… it just seems to me to be a binary thing. Either it's all available or it isn't so it seems a little strange to have a meter which is red up until the last moment and it suddenly turns green. But, what the hell.	114
	Hmm… Ah. [mumble] Hmm… I was dozing off there.	
39:25	Advice Needed. Advice Offered. It seems strange to me to have both kinds of advice in the same box just because they are called advice since, since needed and offered ar- are, such different– Now actually it's a question of who needs the advice– whether it's the user or the, ah, computer.	115
	Hoard Walk Advice. In this window– Hmm. Why– So why is this one called Advice as well? I think Advice is being over used here.	224
47:10	…shows you the average network bandwidth. Does this bandwidth mean the bandwidth, mean the bandwidth I've been getting recently or the bandwidth I'm capable of getting recently?	225
48:10	Oh, OK. So that that tells me the detail. This is like a Microsoft interface here. This tells me the detail of what's happening.	
48:25	This is the cost in seconds and whether they're fetched or stopped asking. I don't know. R-I actually don't know at this point whether this thing is working on the hoarding or not, or whether it's just thinking about doing it.	235
52:10	"Please request that all the tasks be fetched using the "Fetch?" button." I don't understand how to do that at all. "Please request that all the tasks be fetched by using the 'fetch question mark' button." OK. Well that seems to do it.	283
54:00	[Space2] Huh-oh. Wonderful! Boy that's the fastest facilities action I've ever seen.	
55:40	Double-click on the word "Tokens" on the indicator panel. OK. So it's a little out of sequence here because I didn't– I– ah, it.. started talking about "Destroy Tokens" and "New Tokens" before I double-clicked to even see them.	117
	Hmm. Dozing off again.	
59:25	So this just says: Notify– yes; the urgency is normal; you don't pop-up; you don't beep and you don't flash. Sooo, what do you do? Oh I guess you just put something somewhere. A window I might see later.	38
1:00:10	Under the Advice indicator, please sel– Under the Advice indicator please select the "Read Disconnect Cache Miss" event. So you're the advice indicator.	226
1:01:45	[Last paragraph of EventConfiguration3] I'm actually getting kind of lost here about why I'm doing all of this, but that's another problem.	284
	It's not done with a pop-up, but it is done with a flash. : indicator light– not just flashing the whole screen or something like that.	118

D.1.2 Exercises & Debriefing

Due to time constraints, the debriefing of participant C1 occurred simultaneously with Phase Three of the Exercises. A note is entered in the table below to mark the position when the debriefing began.

Time	Transcript	ID
	Oh, one thing. We found a bug after we started. If you use any funny characters, like parenthesis, in task names…Use letters in task names. Don't use anything else, otherwise… Just use letters. **…it can crash the interface. We have to fix this problem.**	
	[Changes normal color to gray.]	
4:21	[One or More Tasks unavailable] Hmmm… I wonder what that means… OK. I just don't remember that, but my guess is… Ew, who knows... Ah, OK, so I'm going to say "yes" here [will interface notify the user?] because it's obviously, ah, since, ah, you asked me further questions the answer must be yes. But, I don't. OK. The idea is I should go and look at, ah, some settings here. So I want to go look at the Control Panel Behavior, and a, ah, logical, no, no. So Advice? No, Advice will not, doesn't, tell me this. [mumbles] This just tells me the state of the Control Panel. Maybe I can use Help– nope. So, I vaguely remember that I had a way of indicating this thing to control it somehow but I've forgotten. Maybe it was the urgency– event configuration. OK. And this is the, ah, no, here we are. Does the interface notify? At what urgency level? Yeah, so I must have slept through this part. So this is an event– operating disconnect. I wonder where I find the event (and- ah) Physical Connectivity. Disconnect from All. Haydn. Urgency Colors. Event Configuration. OK. So I just don't remember, um, the answer to this question, but, so I'll, I'll just guess that it happens when we're disconnected and then by reading this little form here I can set yes it will notify; it will do it at the critical	147 119
	So since we're not <u>really</u> doing this with you as a user. Yeah. **This is one of the usability problems that we've, um, documented. And that is, um, I changed this interface, um, based on comments made by one of the pilots– that they wanted to know what indicator the events were– were coming in on. I ju- used to have just a list of events; it was one of these things… [points to listbox]** Yeah, right. **…it had a list of all the events and I never told them what indicator it came in on. Alright, so when they said "Oh, show me what indicator" I thought "Well, you know, the best way to organize this is to select the indicator and then it makes the list of events much smaller." Alright?** Yeah. **But the problem is that you have to know what indicator event– an event is notified on. So this is, this is by far the worst usability problem that I've found.** Right. Ah– Although, I mean, this is like, sort of like, a quiz question and whether it's important for the person to know **close door – feedback**	

so it makes it… harder for me to answer this question what I really needed– what you're saying is that all these events are really here but I just had to, ah, know under what thing they would, they would occur.
Right.
But, I don't know if it's a really terrible usability thing because this question– suppose I never in my life– well, maybe this is an important, ah, this is probably an important one, so yeah, I guess I, I guess I should know when that's going to happen. Let me see if I can answer this now.
:
I don't know if you saw, yeah, you what saw what I was doing. I was sort of looking at one event thing, but I missed the other ones.

[When do Tokens expire?]
OK, so, I do that by looking at the Tokens thing I guess.

[Task Details]
Now the fact that some of these have not been successfully hoarded, or completely hoarded, yet I'm not going to worry about.
: [What's available]
Hmm… Actually, you know, I've forgotten. I assumed the red meant there was a problem [reads Help].

[Hoard Walk Advice]
Well, I don't know. This guy's blinking at me, but who cares… OK, so this, so the hoard walk wants some advice, and [User opens Hoard Walk Advice through Advice indicator, closes advice request window, and can't get back to it because Advice considers the request completed by the close.] Oops! So now I'm lost, ah, because it was asking for some advice. Now let's go look at the hoard walk thing to see what that says. So now I'm stuck because [mumbles]. Now advice on that hoard daemon has now the [mumbles]. "Please examine the request, decide what objects should be fetched at this time, and describe you reasoning below." Ah– Advice indicator's 120
14:35 xterm. Help. Well. [mumbles] So I did click the entry. The problem was it then sort of went away. Ah, and I, I as far as I know, I never gave it any advice. So, um, I'm just going to say all that.
[Door opens]
Hey. I'm going to flunk this.
No. I noted your problem. Um. Turns out you can get to– This is the window that came up when you double-clicked on advice. It shouldn't have disappeared like it did.
Uh. OK. I double-clicked on Advice and this came up. Oh!
You can get to– This is the one that, that, is appropriate through both the Advice and the Hoard Walk indicator and you can do it from both ways. And what I just noticed a minute ago is that it disappears the second you bring up the window from the Advice indicator, which it shouldn't do until you answer the question.
OK, so I, so I could advise it now…
15:45 **Yeah.**

OK. So I said to fetch that [SOSP16] first in case anybody cares.

17:17 [Hoard Walk pops on top when it finishes the walk.] 121
17:30 Go ahead and hoard walk. I don't care. Get that out of my face.

24:13 So I double-click in that window [double-clicking an empty "contains" list brings up a "New…" data definition window!?!] and luckily it happened to be there. [The user then expects the newly defined element to appear in the "contains" list.] 122

27:?? Well, I don't see… the data. Oh? Did that work by dragging-n-dropping. No, Ah– 23
that I can get rid of that by deleting. [User hit "Delete Task" button.] Uh, uh, uh… 6
Ew. So I just went all, to all that work typing those guys in, but now they don't appear

here. [We apparently lost the data definition.] I'm bummed. 139

[User types a path as the name of a definition]

28:40 So, now I'll save it as the bugs list. And I'm going to quit [close] and I can now drag [user attempts to drag a data element from the "predefined" list to the "contains" list] 23 this thing over here. Yuck! Don't like this interface. For that, it's too, too much monkey business as Chuck Berry used to say.

32:25 [Programs– modifying]
Add /coda/m-i-s-c/gnucomp/i-3-8-6 mach/omega/b-i-n/g-d-b. So I've now added that guy. Ew! I hit a carriage return and it disappeared. Or did it? Ew, how horrible! So 107 on a Mac I would say <Control-Z> or something and now I gotta type this whole thing 92 again. This is not so good.
[Re-enters path]
So to be on the safe side here. I'm just going to save this guy. Ew! I hate this. It just went away, but I saved it anyway.
What did it do?
[Participant explains that when he hit a <Return>, it just disappeared. There was some discussion over whether or not the pathname had been highlighted, but in fact, it had not been.]

[Tries to cut from one pathname to the next.]

Oh. So now I have my headers, and for some reason it moved "misc headers" all the 23 way over there immediately. So that's all fine. I really don't dig the use of the 123 "predefined" list and the actual misc headers list. It seems to be a s-… sort of goofy way of doing it all.

Well, now among the predefined programs, we don't have either Scribe or gv or any of that. Ah.
:
But now I've got to go back and figure out how to get all this Scribe crap in there. Well let's go look…cd [uses xterm] So my problem is I know I've got to go and get Scribe. [mumbles] So the CV files are there. To run Scribe… So I need to find where Scribe lives right now and I haven't ah, ah, yeah, my my Unix skills are deserting me now, 'cause I don't know how to find stuff.
[Experimenter points to the portion of the screen that tells him the location.] 124
Oh. /coda/misc/bin. Yeah. Thank you. I didn't even read that.
[User notices that /coda/misc/bin does not exist.]

47:00 And now the programs for Scribe, ah, are here. Now I'm just going to stuff in all this. Ah. C-a-d/coda/misc/bin. So I'm going to say those are– gee! You know, I'm surprised that I don't have, ah, I don't have– oh– /coda/misc/bin slash. Oops. Ah. Revert. C-o I'm trying to /coda/misc/bin slash. So now I save this. But what's bothering is I wanted to say give me everything in all the subdirectories and it's not 125 giving me those little buttons.
:
But I'm still kind of bothered… that… it's not giving me the opportunity to say… fet– fetch everything there is. Ahhh. Hmm. Anyway. So anyway "write CV" has– Well, to a first approximation I'm not sure this is going to work, but "write CV" is got a subtask called Scribe stuff and Scribe stuff says bring me all the programs. Ah. So this was a little more elaborate than I wanted it to be, but there you are…

49:?? OK. So here are my tasks. So I guess I must want to do– Ah, Do I do a hoard walk to decide how to set priorities? Gee, I don't remember. OK. It's not– it's not there. 126 Tokens and Space– No, not there. Advice– well maybe– it must be a task. Oh. So these are the– these are the Tasks. Hmm. OK. So these are the tasks I've got. And I decided to–. Hmm. So, writing CV, editing, Darpa Grant, Scribe stuff, writing SOSP. Uh. Now what's making me sad is that I don't have, uh, my bug fixing things. Well,

too bad. That's so. So how would I get a task? So those are the tasks up there, and I want to–. If you haven't already hoarded these tasks, please do so now. So this is, this
50:30 is the Task Information. So maybe I do something in the Hoard Walk here. [User double-clicks on the Hoard Walk indicator. The window is already visible, but no 208
indication is given to the user.] So Task Information and… Let me try this again. If I say Hoard Walk Information… Well, I tell it to go a Hoard Walk. That's fine. If I double-click on Task, it brings up Tasks. It's got a hoarded tasks and it tells me what their priorities are. Ah. Advice doesn't do anything for me. Repair. Nah– nothing.
51:20 Ah. Well, maybe the Help will tell me what to do.
[Help steals focus] 13
[Reads help.]
Oh! OK. [Reads more of the help screen.]
Alright. Alright. It's all coming back to me now thanks to the help letter. 277

[Bug task is missing. **Experimenter instructs not to worry about it, to just verbally explain where you would have put it.**]
OK, so now we'll say do the Hoard Walk, which I've already done a couple of times 121
strangely enough.

Due to time constraints, the Debriefing occurs concurrently with Phase Three of the Exercises. The user did not play tetris.

The task thing turned red and was blinking at me a little while ago, but when I double- 9
clicked it, I actually don't see anything, ah, terribly wrong here so I'm not worried. 253

[Why aren't meters a binary thing? The reasoning is that users may find it helpful to know which tasks are <u>almost</u> available. Clarify to user that a partially available task is indicated by a red meter.]

[RVM fills]
And I guess its, ah, critical. I guess it's, it's red isn't it? So that must mean critical.

59:00 **OK, so the next comment was you thought it was strange to have both of the advice needed and advice offered all in the same window.** 115
Yeah, I mean that was just… I don't know why, I mean I sort of began to get the idea that, that it was a kind of a dialog box, but, but actually the whole notion of, of Venus offering advice if that's what it– who was offering the advice was… ah, was kind of strange to me and certainly I don't… ah…
It's kind of hard to envision, since it's not there yet.
Yeah, (Since, yeah, since, since, since it,) since it's not telling me anything, I don't know what it was– what it was for and calling the thing advice, I, it actually advice is, [mumble] the name advice actually is little bit screwy to me in the sense that, ah, from 227
my Macintosh experience it's just a dialog box demanding an answer.
:
I don't know what I would call this, but… Both calling it advice and having the advice 227
go both ways so that you don't know which is the man and which is the machine is a {224}
little…a little strange.

Oh, OK, so my space problem went away miraculously even though I didn't, ah, didn't call anybody from facilities.

And as I noted, I, I was, the other thing that was sort of bothering me at the end was, 123
um, the sort of multiple layers of things that I would need to do to create a task in the 203
sense that, uh, that that I was both I was both the- the- there was the predefined list and the things that are listed on the task I would think that it would. I would say "Hey, look, a task is, a task is, a task is a list of program, a list of files and, uh, or a list of programs, a list of data and some subtasks if you want them. Ah, and, just give me a list of those things, and I don't or actually I, nnn, maybe I just didn't figure it out so and then I would think…

[TaskUnavailable event occurs, causing system to beep three times.].
…So, I interpret this thing as being a warning because it just, ah, notes that CV is not available ah, but I sort of knew that because so I assume assume that the thing is just supposed to be hoarding it so my answer is that I just wait… 254
:

So I guess what I, I think it's doing is, ah, telling me that because it thinks that I wanna, because it's a high priority and it thinks I want to write my CV right now that 254
maybe that's why it's upset, but I'm not upset at all.
[Explains why meter is flip flopping– user started his own hoard walk.]
OK, so now I've got another task complaint here. And it comes up here and it tells me. Oh, it says that "Write CV" is, ah, 100%– that's good news. So in effect it looks like everything is 100%…

[User had commented about getting lost during event configuration section of tutorial. User was unsure why he was doing all this stuff.]
I don't remember exactly what I was doing, [mumble] I was having that frustrating time of not being able to answer a question I was asked.
[User doesn't remember why he made the comment.]

[User understands weakly connected notification.]

[User reads and understands weak miss query, but has forgotten that primary task is 149
latexing his thesis.]

[User understands disconnected notification.]

[User understands disconnected miss, but decided he is not latexing his thesis today.] 149

Oh, yeah, and what happened, at one point, at one point I was doing something in some windows, and in a previous window, ah, after I'd done the carriage return the thing very nicely, first of all, I thought it was kind of bizarre that, I understand why it might be, but it was like, a little bit disconcerting that I had to do the carriage return before the thing would let me press buttons saying "None", "All, ah-, all immediate 20
files" or "All files recursively". But then, now, but then, [mumble] but I got, but I got used to doing that I said "OK, I understand how to do that every time I typed in a file or a directory or something, I have do that." But then, in that particular window 125
[program definition window] I was in those, those dia–, those buttons just weren't there.
[Experimenter explains the way program definitions work.]
If I were doing this, I would just sort of always assume that the person wanted <u>all</u> the subdirectories that were there and then would give them some other option to specify something else. Because after all
so you would make the default "all descendants".
All, yeah, I would make the default "all descendants", because I actually don't know 58
what to do if, oh, I would make the default "all descendants" because, in fact, what are the choices. One choice is getting all the directories. I don't care about the directories at all. I want the <u>stuff</u>. So saying don't give me, don't even give me the immediate
descendants– I would always say "all descendants" and then if there were 113
too much {57}
If that was too much stuff, then I would just say, "Oh, well, you're forced to go down and specify these things, at, at a lower level".
In more detail.

Because there's, in no way do I want, the sort of… It's just not meaningful for me to say "just give me the directory". I don't want the directory. I understand why Venus might want it, but I don't want it. And, to say give me the immediate descendants, um, I don't act– well, [mumble] at this point, I don't (know?) whether there are any subdirectories there or not, that's the major thing so to say give me just the immediate ones would require me to know that there's some subdirectory in there, like a help subdirectory, that I don't actually need. And that would be, I'd really have to have a lot of detailed knowledge for that. So, I would always say, "give me all the descendants". And then, to cope with this thing you were saying about maybe that

would be too much. In those cases, I would– I just wouldn't be able to use that directory at all. I would have to go down, and list explicitly list the three subdirectories that I did want, ah, ah, for the descendants. And so that would, sor- that all that part of the interface would just be- go away from my point of view, and that would be fine. You just say "If I name something, you're gonna get that- you're gonna get everything thing that's there." Uh, and then, and then, and then the person after, you know, then when they get burned a couple of times, and say "gee I really can't take all that stuff", then they would just go down and specify a longer, a longer list of things that they did want. That's the way I, that's the way I would do that.

[User missed the token expiry event – was talking.]

[**Experimenter tells user not to bother trying to guess the password.** User understands that the tokens have expired. User explains that he doesn't know what reintegration is, but that he assumes that it doesn't require the network. Asks the system to go ahead.] 238 239

[You commented that you didn't like predefined list. Please explain.] 123
Okay, define a task. OK. And now my job is to fill in a bunch of things here.
So you want people to type them in?
No, but, ah…
You think maybe checkboxes?
Well, well, but no, the thing, the thing that was bothering me that I didn't… [mumble] In the cases where I did have to type them in, which was I bet, which was I think was like the Scribe…
data and programs
I mean, in the cases where I did have to type things in, I had to go and get them onto my predefined list. All I'm saying is that, it was sorta like, in order to get something in this box, I have to get it onto the pre-, I have to get something there first. And, then in order to get there, I gotta click that and by the time I'm doing that, (I'm) forgetting where I'm at. So I suppose what I would say is that, ah, that what would seem more natural to me, is if you would just say "Okay, here is the list of tasks. Okay, I mean, this is just sorta like a file directory. Right? I mean, the way, I think, the way, for example, that actually, that, I did that one time by the way, and I said, "Oh, okay, this is good." Here's what bother- oh, here's what bothered me. [chuckles] Is I said "Okay, I'm supposed to put something in there." And, I said, "Well, gee, how do I put something in there?" Uh, and I'd lost…
Did you double-click there and it came up with "New…"? 122
Yeah. Yeah. [chuckles]
Well, that's a new one…
Well, but then, and then, and then I dutifully typed in a bunch of stuff. And then when I closed this…
You didn't save it and there's no indication… 127
…there was nothing there. And I was, yeah, and I was, and I was pissed.
That's a bug. I'm sorry. I saw you do that.
[User may have saved. May not work if you double-click in (empty?) contains list.]
:

In the Macintosh world, ah, if I'm supposed to fill this out. Ah, I'm just supposed to use some other general mechanism to go and find a list of names. I mean, see actually, so I don't know, ah, ah, when I'm looking at all this stuff, I'm, I'm actually lost about what these things actually are… I mean I understand that these are, these are titles for things and underneath the titles are a bunch of files, ah, but all the, the indirection through all these names and everything is getting me down. So, if I were, you know, if I were, the most intuitive interface for me would be to say "Look. It's a list of files. {203}
It's a list of files that you're supposed to put in here. And, if that's too gross for you,

you can always use the subtask mechanism to have an alias for a bunch of files. Ah, Ah, or it's a list of files… So, or, I guess, I don't know. But if, if I were defining the task structure, I would just say "Look. A task, a task, underneath it all, a task is a list of subdirectories."

So you want hoard profiles.

Hoard profiles?

That's exactly what we have now.

[Both: laughter]

Well, I don't know wheth-, I don't actually know. I mean- I. So you're probably trying to respond to… What I'm complaining about is just getting confused here. It may be that if I, if all, that, put it this way, the most obvious thing for me would be to write "a task, a task is equal to a list of subdirectories". Now, for the moment I understand that I can, so in Unix the way I could, well, come to think of it, yeah, so, a task is equal to a list of subdirectories, ah, which, in fact, I could accomp-, I guess I could accomplish in Unix by inventing myself a, a directory and then putting a bunch of symbolic links in it, and I'd be done. That would be, I mean, that would be, like, coherent with the Unix world of doing things. So you could, 'cause when you first, I mean, when you, I certainly understand the problem is that the subdir-, that the, um, that the tasks are invented, the tasks are invented to overcome the fact that the directory structure doesn't reflect the task structure perfectly. Ah, but what, and, okay so we're, so all I'm, all I'm saying is that, yeah, this, this learning this new, learning the interface to the task system was a, was a ah, is a kind of learning task that I was faced with, that any user is faced with, and I anyway, if you just said to me, if I want, [mumble] Well, suppose you never invented the task thing, then what I would say to the Coda users of the world is "Well, look, you specify, for, for hoarding purposes, if you, if you have a bunch of things that you want to be fetched, just invent yourself a directory and point at all the things, you know, that you want using symbolic links and that will organize it just fine for you. And, and, that, and that, that actually wouldn't look- might not look as, look as nice as this, but, [mumble] for all the Unix users, they'll say "Oh, OK. I get it. I can just do this." Because they already have that skill, whereas I had to learn, and I guess this is always a problem, [mumble…] Even though this thing might be better designed for the specific thing you're doing, it also required learning. So, so these things here, so yeah, so the thing that was confusing me is, after a-, after awhile, I began to get a, I said "Okay, when we get down to bedrock here, everything here is actually, underneath it all is a list of, is a list of, is a list of paths." Um. And so going through all the, the, having to do all these preliminary steps in order to…

all the graphical part

1:20:15 Yeah, ah, but it's a, a, it's a tradeoff. I mean, after awhile, I mean, at one point there, I got ambitious and defined a subtask called Scribe and everything, but I didn't, ah, ah… :

[User discusses how mh uses a bunch of little Unix commands in the spirit of Unix. Could we try the same thing here? Potential problem is that programs and data are getting treated differently.]

[Experimenter discuss difference between programs and data.]

Another way of describing this interface is would just be, um, by rehearsal. You say, "Okay, look, I'm going to go away, I'm going to go away for a week, and when I'm away that week, here's the kind of things I'm going to do." […] Then, I would just rumble around and touch things. And, I would be touching both the programs and the data. So, it isn't obvious to me that the data should be treated differently from programs.

[Explains that we want to reuse program definitions. That much of what programs touch are independent of user data.]

Yeah, I think, actually, I think that's a, that's a good observation, but actually it's one that I would try to…that's kinda, that, that's kind of a, you're basically saying that if we sort of look at all the files you're going to look at there are going to be… certain, to describe this in a neutral way between program and data, you're going to say "We know that if you ask for one set of things, that you're probably going to get a whole set of other things too because that's just the way it is and if these things, and that's particularly true among the programs because the programs have all their own binaries and everything that they're fetching in and... I mean, even independent of the font files and things, maybe 90% of what a program touches is its gonna touch no, no matter what was whether it's you using it or somebody else using it, and then there's the 10% of special stuff which may happen just for you, or, or may happen commonly across all the things that you do or maybe just for, for certain things you do. But, in any case, uh, as a naïve user, I don't understand that thing and so may(be) it shouldn't be in the user interface that somehow that you're, what you do is, I mean another completely much mo-, much more automagic thing might be you just tell the person to rehearse their activities and when, and y- you sort of know the difference between progra- somehow you know the difference between program and data, maybe that's a problem but…, let's su-, let's su-, let's suppose that underneath you're able to say, "Oh, th- th- he's executing a bunch of stuff here and it's Scribe and TeX or everything or it's being fetched out of binary files or something and so you collect the st- the statistics for that thing… you- underneath it all, you're sort of collecting the statistics. I guess another way of looking at this is to say…if I describe this in sort of a neutral way, it would be… when… when the person starts fetching something from, their directories come, direct-, there's a certain predilection in directories, there're some kind of directories when you go into them, that once you go in there, you're probably going to get everything in the directory, which might be true fo-, for Scribe and for program directories. Then there're other kinds of directories where there is <u>no</u> presumption in the fact that you're, you know, which like, […] your home directory or just your memos files or something, there is no predilection that if you've gone into it, you're likely to get more than one thing from it, and… and that's probably a true property, ah, but, I would try, I mean, my, my, you know, just my intuition after, after a couple of hours is that I would just make the user in-, I would make the, I would not try to expose that distinction in the user interface, but just to make it work for you underneath by being slightly more, more clever or something, I mean after all, this is ah, the thing about this is that it's, about the whole hoarding concept is that it's all meant to be statistical, right? So the person is kind of, in the sense that, if the person ends up on the other side of the world and they doesn't, doesn't have and they don't have their files, they can't sue you because in some sense, I haven't been given enough control over it so that I could guarantee that everything I need is going to be there, so if, if the thing's making a mistake, [mumble] you're trying to be, you know, semi-automatic about it so, ah, okay, I mean, after a couple of hours, the interface is more confused than, more confused for me than I than it's actually doing me any good.

Now after a couple of months I would find "oh, I really need", you know, one of the biggest problems you probably have in designing this interface is that a lot of the people who are giving you suggestions for it are, are experienced users who are trying to overcome problems they've been living with for months or years. Whereas for me, it's like a, two hours of problems so I don't, so I don't even see that it's solving a problem for me.

[Discuss who the subjects are in the user study. Experimenter explains that they are all graduate students. 3 Coda experts; 3 novices.]

Yeah, OK. Well so, well anyway, but, this is, this is, this is good. In a sense, what I, what I, I guess what I'm impressed by is that actually, you now, I could sort of se-, the tutorial, even though it was a pain in the butt to write, really sort of works. I mean you know, I mean, it's sort of like having a, um… So, I would sort of count one of your,

ah, contributions here is being able to, to describe the functionality of Coda in, you know, 100 words or less, or a thousand words or something which I don't think was ever-[…]
45 minutes or less
Yeah, right, well so which I don't think was ever done before and is an import- important part of system design, probably, probably more important to do it, I mean the, I mean, all the HCI bigots will say it's more important to… Ah, this should have been done N years ago so that, so that maybe design decisions would have been done differently so that, ah, so that ah, ah, it would have been easier to describe and easier to use. Ah. But that's, that's the, that's the, you know, the eternal tension between the ah, the engineers and the, ah, whoever the other people are who worry about users. Uh, I mean, for many, I don't know, actually, Coda seems to be pretty well organized, but most, many systems I know who have been done by the kinds of people doing Coda always look to me like a bunch of pieces out on the garage floor and you come in and you're, you're supposed to make them do something and they, and, and you have to, you know, spend, I mean, all the systems we used to build at Xerox and everywhere, they were always like, just bunches of pieces which you had to put together and it was gonna take a year to figure out how to put them together. So this, ah, this makes it more plausible.

D.2 E1

D.2.1 Tutorial

Time	Transcript	ID
	So, walls…I'm guessing walls is this red outline (around the xterm).	285
7:29	[CodaConsole started] Okay, something just popped up. A little box. Control Panel, Tokens, Space,	

	Network, Advice, everything is green. I'll bet that's good.	
8:47	[Color blind– other cultures] OK. So, I can do those colors. I wonder…so, traffic lights have that, th– the ordering and I wonder if something like that might work here too.	
12:55	One of what servers? Had the color been red instead of yellow, the indicator would have been showing that our connection to at least one server had been severed. OK. Double-click on the network indicator for more detail regarding our connection to individual servers. Aha! So that will tell me. I see. OK. Cool.	
13:29	So what if we have 100 Mb/s? Can that be scaled I wonder.	50
14:15	Soon the bandwidth to scarlatti will drop to 0, which it just did, and Oh! It's blinking yellow and red? Ah, I thought it would have just changed red. This indicator flashes red and the network information window automatically updates to show the change in scarlatti's estimated bandwidth. OK. Oh, so it stops flashing... So maybe that's just to draw my attention.	9 33
16:00	[First impressions of Task Information window.] So, cache space. Alright. So the task, I'll read, instead of trying to figure it out. Although, let's see, so it looks like there are 97 MBs available and that 70% of it is either available, 70% of that 97 is available or 97 MB is available. Let's read.	269
	It's too bad this window manager seems to pop everything up up there.	1
22:10	[First impression of Data Definition.] So it looks like a hoard database shown in widget form.	
22:15	So I wonder if there's they have the old hoard now and forever or just now notation as well, I wonder, I'll bet it's just now and forever.	
22:30	So I wonder if they gray out if it's a file.	
23:00	Meta-information is a weird name here.	209
23:30	Ah, yes, so they are grayed out when nothing's there.	
	Interesting that it's not <Tab> [after naming the data definition, you hit <Enter> to move the cursor down into the definition area.]	3
24:35	[Task10: <Tab>/<Enter> explanation for data definition meta-information.] Alright, I'm confused. "If the pathname you type is a directory, then, when you hit either <Tab> or <Enter>, the meta-information area will be enabled." Alright, so let's go see if I can rename this. Ah... Better not try that. <Tab> just selects the window and another <Tab>. OK. Hit either <Tab> or <Enter> the information window "will become enabled, allowing you to choose the appropriate meta-information for this entry. If you used <Enter>, an entry empty entry." OK. So <Tab>, <Tab> sends me to the meta-information entry as does <Enter> and <Enter> additionally adds an empty entry widget. OK. "You'll need to use the mouse to select the appropriate meta-information. If you used <Tab>", mouse, no keyboard shortcuts, "you'll be able to use <Tab> and <Enter> to move around and select the meta-information." Ah! OK. "If you continue to <Tab> after selecting the meta-information, a new entry widget will appear." Well, let's see.	3
	So, <Tab> zipped me to "Save"… So I really want <Enter> there.	3
	If I make it wider, what happens. Ew. Bummer.	4
	[Sees the scrollbar on the Task Definition window because an entry exceeds the horizontal width of the widget.] Oh, OK, so there's a little scroll bar down here. Well, that's good.	
	Actually, it's a group of programs it looks like.	

28:30	Executable, but I wonder if there's other stuff.	
29:00	Oh?! … Once you have indicated an interest in a program, the system will track what files and directories that program requires to run. Neat… Although the system will ignore any files and directories in areas of the file system that you have defined as user data. So how do I do that? By making this distinction between program data and user data, we can let you share program definitions among different tasks. … So, it's just like spy, but somehow I can decide that portions, subtrees of the space aren't spyable.	
30:10	A new set… So it seems like program is confusing 'cause I think of program as one executable, not a collection.	210
32:50	[modifying task] First, we should change the name of this task. OK, so I'm confused… Oh, so if I change the name and save it, it'll be a new task. I guess. It's not intuitive, but I guess that's what's going on.	5
	[Surprised there isn't a button to remove a choice from a definition.]	6
	I didn't expect it to alphabetize caps and uncaps. OK.	7
	Oh, just clicking it adds it.	23
35:10	[Selects a task for hoarding.] That beeping is surprising… I wonder if that beeping means I'm in trouble cache space-wise. : Ah! Because it hasn't been hoarded. So, what are those bars? Maybe what's available– what's hoarded. That could be.	261 268
36:50	So, there's no notion of yellow. Ew– can I change the colors here I wonder 'cause what if I'm colorblind here too.	255 240
38:15	[System must help user prepare for disconnection.] Amen to that.	
39:30	[Notice that you're weakly connected.] And everybody is at 1 although there is no actual color.	8
	OK, so I wonder if, they also order it by priority.	
	[15 second timeout] That seems (mighty) short, but… [continues reading…] Ah!	
43:??	So, I wonder if it would keep asking me over and over for the same file.	241
44:45	[Request for hoard walk advice arrives.] Yep, I see bunches of people blinking. That's weird so advice blinks green/red and hoard walk blinks yellow/red.	9
45:15	[Both indicators allow you to get to the advice request window.] Oh– that's strange.	10
45:30	Ah– Advice. OK. Interesting. So it's not the same window I got last time.	11
47:10	And I'd bet it's one of those little collapsible tree dudes.	
	Some of them are grayed out– some are bold-faced. I wonder what that means.	
48:45	[Expand each of the nodes.] Ah, OK. That's what the italics means. "If the task name appears in italics it means that this node appears in more than one location." Very neat! [for example] Fair	

	enough.	
49:20	So that's weird. It looks like, I have to click the plus sign. OK. One. Ah, maybe I'm just not in the middle of it. Yeah. Weird. OK.	204
	Do I just use the fetch button up there. I guess. Then I click on finish hoard walk. Ah. OK. So it doesn't actually do anything until I tell it to go.	235
	Task is flashing at me now. I wonder why that's doing that.	253
50:45	Ew… RVM. Interesting. […Reading…] I know what RVM is. I wonder what people who don't know what RVM is think.	212
	RVM space is nearly full. Call Josh [Coda system administrator's name]. I like it.	
51:45	So <Return> might… OK should be the default in the Help menu so I can just press <Enter> and it goes away.	12
	[Be careful not to hoard more data than will fit in your cache.]	15
52:10	Hmm… I wonder if it could predict that I would be over, or would be close. Interesting. OK. So, the question I'm wondering is "What if, it seems like at the time I told hoard to hoard things it could tell me that I gonna get close or not close and then I might worry about this or not worry about it."	
53:30	Hmm… I wonder if it shouldn't be "Tokens Information."	213
55:55	So, acquired changes Tokens back to green, if they go away, they get warned; if there's something waiting for them, it's critical. Huh? OK. And then I– OK. Cool. So this is how this all. Ah– neat.	
56:33	So, I guess, what I'm guessing what this does is it switches it from whatever it used to be to green, which so you can't just not notify.	38

D.2.2 Exercises

Time	Transcript	ID
2:33	["One or More Task Unavailable" Event occur.] Let's open the task an– Oh. This is a Control Panel kinda question.	
5:15	User window resize box slider. [Not taught.]	
6:10	[Uses Task Help Window successfully to remind self what green meter means.]	278
12:15	[Space Information Window] I'm not sure if that's what's dedicated or what's used?	270
12:50	[Configuration for Miss Events] I'd bet it's advice. Yes, how 'bout that.	17
18:50	[Looks at src directories to see how big the trees are.]	{57}
19:15	And, then, these are all compressed so I gonna need something to uncompress them– potentially.	{185}
20:35	Hmm. OK. I may have the wrong window… Oh, I have to open a task that's defined. OK. That's right. So, I don't see. Oh, programs defined as. Alright. So let's open a new set. Alright, now I'm back on track.	18

[User explores what's already defined.]

23:01 [Starts defining a task; then goes exploring; then tries to come back.] 19
Ew.. Oh, that's not good! Oh, I didn't save it, and I think I just lost where I started. Well, let's start again. OK. So, it would have been nice if, as I, if I, as I switched away from the task that I was starting to define, it warned me that I was going to lose it.

26:20 [Types in pathname– realizes must hit <Tab> or <Enter> to enable meta-] 20
It would be nice if, if after there I could click on rather than having to <Tab> over to activate this and click– if I could click on it without having to do that <Tab> and then at the click it could check to see if it was a directory.

26:37 That's a little strange too but I don't know what I would want it to do differently. Um, 3
that <Enter> was surprising 'cause when I had it back up here and pressed enter when the "None" was highlighted, it switch from "all descendants" to "None" instead of doing what I sort of expected which was switching me to this new box. So this is kind of a little bit confusing for me.

27:40 Oh, I forgot how to delete this. Hmm. The one thing I'd like to do is I'm going to move Coda sources into hacking Coda rather than BugFixCoda and then just add the bugs bits for bug fix so that hacking might not include fixing prevously reported bugs. So, let's see. I'm going to need to find out. Hmm… To delete an element from a task– Ah– that's right. So select it. Yeah, it's really strange not to have a delete entry 6
down here somewhere, somehow. Right. So Coda sources is selected– Ew– maybe I need to close this. Yeah, And it's deleted. 13

29:15 So, I thought <Tab> would create this new box for me. The sort of difference between 3
<Tab> and <Enter> seems confusing to me. And, it's almost– if there's a consistent way that its used everywhere, I'm not getting it somehow. Which I kinda knew that was going to happen from the Tutorial.

35:20 Seeing the end of it [pathname in Data Definition element] is okay, I guess. If I resize it, yeah it doesn't really change. OK. I'm a little concerned that I can't see this whole 4
pathname. Um. Let's see. O… 21

[Double -click selects the element twice.] 22
Yeah, I tried to double-click on xdvi, to see it. That was sort of strange. Um.

39:?? Oh! That was cute! So tabbing got me to save, saving got me the new box. 3

40:?? Ew. Revert. Oh, that's very strange. Huh. That's weird. So it's weird for me that a 23
single click actually moves that over. Um and I've been having a bit of trouble with single clicks moving things over unexpectedly.

40:25 Boy, it almost would be nice to have one of those tree views for these as well so I 110
could look at them without having all of these windows. Um, 'cause it seems like I'm 24
getting window overload here.

42:52 First, I don't need these tasks that are here at the moment… How did I get rid of them? 102
[Uses Help successfully.] 279

44:30 [Hoarding a new task causes system to beep three times signifying TaskUnavailable.]
Whoops! Oh, OK, that's beeping at me because it's not all loaded.

46:30 Where'd it go? Read headers. Yeah, I'm seeing quickly that I'd need to have sort of a 26
careful naming scheme so that I could find all of these things. When I needed to.

56:02 [TaskUnavailable event causes system to beep three times]
OK. Let's see. Incident report. There is a critical… Oh I, Ah– Duh. Alright. So first of all I missed this one. Um. So I noticed awhile ago that the space went back and then I forgot to fill out an incident report. [fills out RVM report] OK. And then this

	one is the important one. Critical. OK. What it looks to me like is that the reason this is complaining is that BugFixCoda isn't hoarded, but should be, I think. Why would that be beeping at me? [Reads Help Screen.] Let's make sure I understand this event.	261
	Oh, I can't 'cause I'm in Help. Alright so this event was… [Checks Control Panel.]	13
	:	
	[HoardWalk goes off while still completing TaskUnavailable report.]	
1:01:50	[missed a file while formatting thesis.]	
	Space problem? It might be… So the reason I put this space up is that one of the things I'm concerned about is the fact that latex2e got kicked out of my cache. It	28
	might be because there's not enough space in the cache to hold everything I need.	29
1:06:50	[TokensExpired event causes system to beep three times]	
	Oh, I'm about to lose my tokens. Ah OK. That's a warning. My tokens have expired, but I would need a new password, which I don't actually have. Although I'll	
1:07:20	see if it's the usual. Oh– that's bad. That shouldn't be readable.	30

D.2.3 Debriefing

Time	Transcript	ID
	[Explains why the tutorial didn't cover Reintegration.]	239
	[<Tab> vs. <Enter>] That's, that's actually the one area where I found the interface getting in my way. Because I don't think I could explain to you how entering information on the, on the task forms works. … I couldn't necessarily tell you the difference between <Tab> and <Enter>, and I'm, and I'm sure I can't tell you what each one of them would do in any given situation on the task. It, it just feels – I don't know how I would simplify it, but it feels too… like, when I'm there, I just hit some random combination of <Tabs> and <Enters> until the right thing happens. **[Suggests Control keys for meta-information.]** Make life easier. Perhaps more mousing. : The one thing I couldn't understand how to use <Tab> and <Enter> for was how to get a next box. So I would almost create a next box when you start typing the first. I mean, sometimes if I hit save the new box popped up, and so the rules for getting the next box when I wanted to enter a next thing weren't at all clear, and so that… The <Tab> vs. <Enter>, if it weren't also tied in to both entering this field's worth of information as well as setting up things so I could enter a new field, it might have been easier.	3
	To delete things in the task interface, I would have liked a delete button and would have eventually remembered the keyboard shortcuts… **but at the beginning you needed the delete button.** Right.	6
	The interface is clearly designed for people who don't use the mouse often. Unsurprisingly.	
	[Uncertain about which indicator to use to start a hoard walk– Task or Hoard Walk.] With a week's use, that would be less of a deal. Because I would be able to go straight to Hoard Walk and just do it.	31
	[User indicates he would probably use "hoard walk" in an xterm.]	

[Questions about confidence in the preparation for the blizzard.]
And that's just experience. The experience of using hoard tells me I've probably left something out. And this might. I think this is easier, but you know, there's always that fear that 'cause… And usually I'll pull the cable out and try to do the things I want to do anyway before I go home just to make sure I can. And I would probably continue to do that with this at least until I did it often enough that I could pull the cable out and everything would work that it felt like a waste of time to do.

Occasionally I miss the dashboard indicators.

[Indicates that he likes ability to configure events.]
I don't need to see the pop-up window every time I miss something disconnected.
That's the one thing you can't turn off because…

[User might leave network window up all the time in a roomed window manager.]

One of the things I really don't like, currently, is not really sure whether my updates are making it back or not. And not really sure whether, you know, for misses if they are really supposed to be misses. It would be nice to see what the state of…

And the other… One other thing that would be nice to have in, which I don't know how this works with the brave new world. Sometimes, I forget, after I write reconnect, I forget to write disconnect again. And, on my home machine, this is extremely painful because I'm only ever connected via phone line. I never want it to be write reconnected while I'm actually working. And so having some little something saying– "Hey, dummy". Usually, I discover immediately because all of a sudden my machine stops.

[Dislikes single-click copy] 23
It might be, because that's the common case, I would eventually learn to just live with it. I don't know. But it feels, it doesn't feel consistent with all of the other interfaces I've– it doesn't– it's not the behavior I would expect given my experience with other interfaces. It doesn't– I mean I might actually learn to think all the other interfaces should do this.

[Reproduces Bug: Double-click on prog1, then double-click on prog2; prog2 shows up in contains list twice.] 22

So, I don't know if this is a window manager artifact or an interface artifact, but the one other thing that I noticed was that everything shows up here sort of pinned to the top corner. 1
:
The model that I've used so far that I liked for autoplacement is… and if I didn't have autoplacement on this might not be a big deal– if I was not an autoplacement kind of person, but it increments by 10 in x and y until you bounce.
:
That's actually something that should be a window manager issues– NOT an interface issue…

I got sorta window overload at one point… There's lots of windows. 24

You were talking about a tree. 110
Oh, Yeah! So when I'm looking at the task definitions, it would be nice to have a tre– a, a, a task browser that looks just like, ah where did that thing go.
[Experimenter brings up Hoard Walk Advice request.]

	Yeah. If I had a browser like this for tasks, and again this might be substantial bits of work. But that, because one of the tings I found myself doing… **How do you represent Data vs. Programs?** Colors… or fonts, either one. **How do you represent meta– child, dir, none?** See that would be harder. That I don't know. : Even just the names… But, 'cause I wanted to look at subtasks to see which ones to include, 'cause I couldn't keep in my head exactly who included what… [Example: was editing included in XYZ?] And it would be nice to have some kind of browser representation of… or even a dag of the classes. **And you could even double-click on…. To show you the details of the definition.**	
	Expected "commit" to close window as well.	32

D.3 E2

D.3.1 Tutorial

Time	Transcript	ID
	[Introduction4 re: Cannot access AFS.] This is frustrating– Yes!	
4:35	[Introduction6 describes weak connectivity.] Hmm… That's interesting. I've heard of this, but I've never used it.	
6:40	[Interface to keep users informed and help them prepare for disconnected operation.] Yeah, that was, that was certainly a problem when I was using it. Sure.	
7:10	I was a little confused here. Codacon reminded– CodaConsole reminded me of codacon, which was just an output feature before it wasn't really an interface.	
	[Re: "For the record…" on UrgencyColors2] OK, I was just thinking about that.	
13:40	Hmm… I guess there was no feedback when the commit actually happened.	32
14:45	Huh, so it looks like, actually, more than one of them is at low bandwidth, or (maybe) That's all the bandwidth that's (there). Oh, and scarlatti is down, is the one that's really having trouble. OK.	
15:40	Ah, the network indicator is blinking… Hmm! Oops it stopped blinking. Now it's solid red.	33
19:00	When I read tasks there, I was a little bit confused between tasks and subtasks. :	211

19:15	Oh! OK. So a task can include other tasks.	
21:??	[immediate children vs. all descendants] That must be that it's recursive.	214
22:??	[empty entry widget] OK. I guess I guessed right.	
24:10	[User has trouble finding "black down arrow button." Thought it meant the scrollbar's down arrow.]	34
25:??	[Task10: "Yes, the system does check if the path you type is a directory".] How does it tell if I'm going to make up a name? :	35
27:20	[Types in non-existent directory– tries ending path with a /. Tries <Tab>. Just scrolls through things. Tries <Enter>.] OK. Then it goes to a new entry. Oh. OK. So it doesn't think it's a directory. That's OK. [Tries a real directory.]	36
	[System ignores program touching file system objects in user data area.] Hmm… I wonder why it does that.	
30:45	[Saves program definition.] It's a little bit disconcerting when you click on "Save" and it adds the extra blank entry. But that's OK.	37
33:??	[Change name and hit <Enter>] I hope that created a new one rather than just changing the name of the old one. : OK, writing with latex is still listed in that window so I guess it's still OK.	5
34:45	[TaskUnavailable causes system to beep three times.] It's beeping at me. Saying something at 90%. 46 MB. Oh, maybe there's not enough space in the cache. : [reads explanation of beeping.]	261
35:45	OK. So my interpretation wasn't right.	
36:35	[Notices three vs. two typo in Task20]	
	[Please double-click on the Advice indicator– Advice1.] Mmm… Looks like nothing's there yet. : [Notice that you are weakly connected– Advice2.] The network light was yellow, but there wasn't anything mentioned in the advice.	
	Yes, the Network light is still yellow.	
	[Hoard Walk Advice request arrives.] Lots of blinking red lights.	9
48:45	[Expands "All Tasks Needing Data" in HoardWalk4.] Hmm… There must be some overlap since the total cost is less than the sum.	
	[Requests that the hoard walk finish.] And the task indicator is flashing. :	
	OK. The task indicator stopped flashing.	33
	[Reads configuration for Tokens Acquired on EventConfiguration2.] Hmm. So how does it actually notify you if everything else is turned off?	38

D.3.2 Exercises

Time	Transcript	ID
	The defaults [colors] are fine.	
2:10	[Describe current network conditions.] So, I guess I have to go to the network panel for that. Um, they're all green at the moment so I guess that means they are all strongly connected.	
2:55	[Describe "One or More Tasks Unavailable" event and its configuration.] Hmm… Well, I think I can go to the Control Panel– it has help information about that. "Tasks Unavailable" should be under the Tasks indicator, and… [describes it.]	
4:40	Actually, something is critical in tasks– I wonder what it is. Um. I guess it's because the first three tasks aren't really hoarded yet.	
5:??	[Which tasks are hoarded?] Well, I'm not sure whether this means… are. OK. I expect this means which ones are supposed to be hoarded, rather than which ones currently are hoarded. Are actually in the cache.	219
8:??	[Request for Hoard Walk Advice arrives.] OK. So Advice and Hoard Walk are blinking. Ah. Presumably because these things things are not hoarded or aren't available yet.	263
	So, it looks like we have plenty of space available. Bandwidth is not great. Let's look at what files are, it's asking for. So, we don't need anything in the Darpa Grant.. Um… 'cause we don't want to work on that. So let's look at SOSP16 first. Uh. We don't– if we're just reading the paper… ah… it looks like the paper– the paper's list includes a .ps file. So we don't need to include the editing tools for generating that ps file. So, presumably, let's fetch. Actually, let's just fetch the .ps file. I don't think we need the rest. And, and under recommendation letters… Um. So, I guess we need both the letters and the editing stuff for that. I guess that's the same as getting everything in recommendation letters.	
9:30	I guess we might also need a viewer for that. Let me see if that's included here. Hmm… So it's not under either editing or papers. So it might– so we probably should also get the .tex file as well just in case.	
11:40	[Describe the Miss Events and their configuration.] [Goes straight to the Control Panel.] So, weakly connected cache miss advice. This is probably the Advice indicator.	
14:25	[Commits Event Configuration changes for Miss Events.] I hope that committed both of them. [Checks and discovers problem?]	39 {32}
18:50	[Needs sources.] Actually, let me see. Maybe I can just get that whole directory. : OK. There's lots of stuff under there so we don't want to get everything.	{57}
	[Defines a task, then changes name– what would happen if user hit return?]	
21:50	So, given that we want to set some priorities and priorities are set between tasks– that means we have to make a new task. Ah… [does so]	
23:35	OK. I haven't quite gotten the hang of how the <Tab> and <Enter> key interact here.	3

24:??	The pathnames look to be about right. [User has difficulty viewing full pathnames.]	{21}
29:??	Actually, I'm not quite sure how to get rid of them [old tasks already hoarded]. [Uses help successfully.]	102 279
30:??	[Help window grabs focus.] Oh, it probably doesn't respond with the Help window up.	13
30:30	[TaskUnavailable causes system to beep three times.] Ah– It's not completely hoarded– that's why it's beeping at me.	
32:15	[Hoard Walk requested.] So, it looks like it's running. Hoard Walk is yellow. I guess that means it's just running. Task is red. I guess that means because some of the tasks are not completely hoarded yet. So I guess I just need to wait for this.	
33:15	So it claims to have gotten all of the files. Although Task is blinking for some reason [blinking R → G to tell user all tasks available.] Hmm… not anymore. I guess that means, maybe it was blinking to inform me that it got everything. Hmm… That's interesting.	9
35:??	[Phase Three directions.] Of course, the problem is, I might concentrate on tetris and not notice the blinking lights. [User unsure if he should try to resolve the problem.]	41
41:??	[Moves the window next to the indicator lights so that he'll notice when things go off.] I'm not sure whether I'm supposed to fix the problem myself– I could do that. **Please don't.** Oops. So something happened. Let me pause the game. Hoard Walk turned yellow. Ah– that means the hoard walk is in progress. Warning. Hoard walk in progress. We don't really need to fix anything. It's fixing a problem itself. That looks like it's progressing, and hopefully this will clear up the task problem as well.	41
51:??	[Disconnected cache miss questionnaire.] Hmm. I thought it was trying to fetch this object before.	

D.3.3 Debriefing

Time	Transcript	ID
	[Asks user to clarify his answer to Evaluation Question 6b.]	
	Perhaps an indication of "this has changed since you last looked at it" would be useful.	41
	[User discussing hoard and spy utilities.] Yeah, somehow, I could never get that to quite work right. I just wound up using some fixed list and never changed it.	
	[User thinks he lost data in Control Panel. Experimenter looked at action log for the segment he was talking about, but found nothing unusual.]	39

	[Priorities.] When I had two tasks, and was going to put in the third one and I wanted to put it below the second one, but there wasn't really any space. There wasn't much space below the second one to drop it. And so.	42
	[User shows experimenter an example. It is unclear to the user where he can click to hoard a task either first or last]	
	[Scroll down to show most recently hoarded task.]	43
	[Unclear to user where you can click to hoard first or last.]	42
	It was fun!	

D.4 E3

D.4.1 Tutorial

Time	Transcript	ID
	Don't forget to think out loud.	
	I have to say I don't like cars with just idiot lights– I like gauges.	
4:50	Now I'm puzzled. Idiot lights are pretty simple. And, um, dynamic things sound pretty scary. It doesn't seem like a simple indicator. We'll see what this is all about.	
	Maybe not the font I would have chosen. [for indicator lights]	44
	Ew! Green-Yellow-Red. OK. Good.	
	OK. Good. So color blindness has been taken into account.	
5:40	How about flashing? Seems like flashing would be nice at least for red.	
6:05	There's a help in every screen– except for the indicator panel itself. Well, <u>that</u> certainly seems like a mistake. There should be a help button on the… OK.	45
6:30	<u>Double</u>-click!? Double-click. Alright. [on indicators]	46
7:20	So it's interesting this [UrgencyColors2] is covering up this [the Control Panel window]. That's a little sad. That's alright.	47
7:50	Oh!? At least one server at been severed?! See for me, red would mean, like, at least one volume is connected to no server.	256
8:10	Double-click on Network. OK. I don't like this double-click stuff.	46
	…as a percentage of maximum Ethernet bandwidth. Hey– what happens when we have fast Ethernet? Hmm…	50

8:30	I wonder at what point it switches from being green to red– maybe like little bars drawn vertically through here would let you know when it's about to happen.	51
8:55	Well it it's 0, how come there's this little blip here? That's not really very good.	8
	Network the indicator light flashes red. Yeah, but it stopped flashing. Hmm… OK.	33
10:10	If nothing is hoarded, why is 70% of my cache space full? And, is there a way that I can click on something to find out what's actually in the cache?	52 205
	These are ugly scrollbars.	53
	Frankly, this font is a little bit smaller than I would have liked.	44
	In fact, I don't know, I mean, it seems annoying. This is 1-2-3-4– a 6 entry list that needs to be scrolled. OK. Writing thesis. Ew. Lots of itsy-bitsy things that need to be scrolled.	54
	[Task definition] Yuck. Alright. Fine. Subtasks. Programs. And User Data. OK. Hmm. OK. Well, all these little lines [window resizers?] and so on are kind of amusing. User Data. Predefined. OK ... OK. Alright. So I wonder how you define one of these predefined things.	55
12:55	[Data Definition Window] Hmm… I'm not really sure what I would have wanted here instead of what's here, but I think it would have been something.	56
	Meta-information! I'm not sure why that's meta-information.	209
14:15	All descendants seems like an attractive thing to do. And it might be interesting if, like, it would actually tell you how much disk space or cache space that would be in this area.	57
	It chose "none"! I'm not sure that's the right default for a directory… Alright– I– In particular, I think all descendants would be the right thing.	58 113
	I wonder why we have "save as".	60
16:55	Ew! Well. I certainly would have expected "save" to make the window go away.	59
	OK. So we've partitioned anything that the program accesses into either user data or all other stuff. OK.	
	[Typing in programs in Program Definition.] So, it's not clear to me it's actually checking to make sure those files exist.	61
19:50	[Change name of "writing" task to "writing with latex"]	5
20:20	What? Continue to use it for other tasks. I'll do it– I'm not sure why– OK… Oh! I understand… So we've now created a new one, which is a copy of the old one.	
	Ah… Clever. [I have no idea what he's referring to…]	
	Fix the name and hit <Enter>. [Hits <Enter>.] I don't know why you hit <Enter>.	3
	Take away latex and xdvi. [Selects "latex" in predefined list.] latex. <Delete> or <Backspace>. Well, <Delete> isn't doing anything. Neither is <Backspace>. Oh! OK. Ah! So clicking on it automatically adds it?! Hmm… That's interesting. I wonder what happens if I click on it twice. Ah. OK. What happens if– OK. The right thing happens.	62 23 ~46
22:25	[Learning how to hoard a task.] And move the mouse down to hoarded tasks. Right-click [TaskUnavailable causes system to beep three times.] Whooo! Oh, no!	

	This is slightly– yeah. I wonder why just clicking on things here doesn't bring them over here like it did when we were sl- defining um tasks.	63
	[Task is unavailable] Is it <u>really</u> unavailable? Or– it's just not guaranteed to be available? Maybe yellow would be the right thing. Alright, so does this say this would use up– What does this mean? I have no idea what this means here. So, I know that my overall cache is 97 Meg. I guess. 90%. I'm totally lost. Alright. Fine. [goes back to reading, perhaps the help screen] What % is currently available. OK. Green or red only. Hoard	255 269
23:45	priority. Is this just the order that I put them in. The <u>location</u> at which you <u>right</u> click. Oh. And so I would need to, like, oh, no, and I can't, like, pick– drag them around in here. That would be useful.	64
	[Notice that you are weakly connected.] I guess 'cause this is yellow…	
25:50	[Since a process is waiting, it's important it gets immediate attention.] Well, does that mean I have to pop up– if it's needs immediate attention, why do I need to have a window already up on my screen and double-click or something?	66
	[15 second timeout] Well, 15 seconds seems like it'd be too long if fetching the file would take 10 seconds. 15 seconds doesn't seem like long enough if it would take 4 hours to fetch the file.	67
	[Weak miss query pops in NW corner of screen.] You know, popping this up in the center of the screen would probably been better idea. Also, having a count-down timer I mean if it's… Yeah, I think a count down timer	1
27:05	would have been good.	68
	[Not covering "Advice Offered"] That's too bad…	
28:15	[Requested immediate hoard walk.] I wonder why it turns yellow? Is there a problem?	258
	That's pretty weird. So the hoard walk thing is blinking yellow and red. Advice is blinking green and red. That's very interesting.	9
29:00	So. Hoard Walk. Yellow means operating and red needs help.	258
	[Hoard Walk Advice window] So, if we're having a problem, why don't we want to fetch any objects? And why is this zero? [Reads tutorial] Oh! Ignore it. That's why they're all zeros. Good. [Reads tutorial] List of tasks. Cost of each task. Well, I've never liked these little–	
30:30	little– thingys that are– these basically invisible things that change state in an– in an undetectable fashion. Is that selected or not selected? Only the shadow knows.	70
30:45	[Main section of Hoard Walk Advice Window.] Yeah…. This is…. I'm not sure I like this "All Tasks Needing Data" thing.	71
	Oh. OK. [can understand] Yeah, that's nice. Good.	
	[Notices an upper-case/lower-case problem in mockup.]	72
32:50	[Looking at partially expanded tree of Hoard Walk Advice window.] This is a little interesting. Why is it showing me some stuff here… if it's not expanded? That is– Oh! This is a peer of this. Alright, well, if it's a non-expandable thing, maybe, like, putting a dot here or something like that would have been better. 'cause really it looks like, since, looks, visually like this is indented further than this. And so that's a little confusing. OK. Fine.	73
33:10	[Fetch? Buttons on Hoard Walk Advice window.] Oh. These– These are horrible! What's the matter with a checkbox, is it patented by	70

	somebody?	
	[Clicks "Finish Hoard Walk" button.] Turns yellow. Yellow– alright. Fine.	
	Wonder why Task [indicator] is blinking red. I guess. And, now it's green. But how come it's green before the hoard walk is done? [mock up interface bug]. Alright. Fine.	9 74
33:50	[Space Error event.] Yeah, you got it. I'm not sure why fla-fla flashing from green to red is the right idea here. That's a little confusing. Like, maybe red flashing on and off would be right.	9
	[Click on Space Help button.] Good. So this– these– little bit subtle. Like. It doesn't look like a big button– it looks like. It's sort of– alright. Fine.	75
	[Clicks on Help button] Hew… That popped up in a really convenient place. Look. Why don't these things pop-up in a slightly more convenient place. Alright.	1
	[Reads help for RVM Full problem.] Oh. Please contact your administrator. A little bit of expert help would not have been too bad. Like, you know, reinit with this flag.	76
	84%– 8 is mushed up here [on the meter]	77
35:30	[Space Help re: cache filling] How about, like, contact your system administrator and get a bigger cache?	76
	[Directive not to click on destroy tokens and new tokens buttons.] Well, okay, but, I mean, if I've never, I mean, how would I expect them to work if I'm a user of, I don't know, Novel Netware.	78
	Hew, and the Help flies up in a totally different part of the screen.	1
	[Coda tokens are similar to Kerberos tickets.] Once again you're average Novel Netware user has no idea what any of this is.	216
	I wonder if any events are good things.	
	Maybe "Control Panel" should be, like, I don't know, "Alerts" or something like that.	215
	For maximal user brain niceness, instead of having this be a drop-down thing, having a copy of this little window [indicator lights] over here [on Event Configuration tab] would really be nice.	206
38:30	[Event Configuration Tab] So, wa-wa-wa-wa-wait. Name of the indicator light. Name of an event. Ew… Well– yeah. I think there's probly some better way of laying this out. Like. Copy this over here. And have when you click on each one have a a little window up here, you know, list the– the various events. OK. Fine.	17
	[Pop-Up– Beep– Flash] How about, like, deliver electric shock to user?	
	[Tokens Acquired] Tokens Acquired should notify me?! Well, that doesn't seem right.	38
	[Reads urgency stuff on event config.] I don't? Wait! Does this mean that– when I get tokens– that ch- this is telling the token light to turn green?	38
	[Urgency Buttons on Event Config Tab] These three buttons aren't really lined up– that's kind of cute.	79

	Um… Alright. But, if I just got tokens by typing in a password, then notifying me doesn't seem like it would be all that useful.	38
	[Reads explanation re: Read Disconnected Operation] OK. I wonder how that's different from how a disconnected cache miss. If I'm just– if I'm doing this as a simulation of this, why would I want the alerts to behave differently? It wouldn't be a very good simulation then would it.	80
41:05	[Examine "Operating Disconnected" event.] So, operating disconnected is not an event– it's a condition. Right. So like, "Transition to Disconnected Operation" would be a better name.	217
42:45	Oops! Well, that's a total lie. My tokens– Wait. I'm confused. So, if my tokens had expired, I would have hoped that this would turn red. Um. I'm not sure what possible yellow thing could mean. And you lied to me. You said my tokens wouldn't expire until tomorrow.	257

D.4.2 Exercises

Time	Transcript	ID
	During this portion of the study, I would ask that you not use parenthesis in the names of tasks, programs or data. Presumably, (hype) characters are also out, asterisks, questions marks? **Let's just use plain, old normal characters. Dashes are okay.** Okay. **OK.**	
3:15	[Finding "One or More Tasks Unavailable" event in Event Configuration Tab.] "One or more tasks unavailable." That's probably gonna be "Task". OK.	17
4:00	[Describe event notification– Popup– No, Beep– No, Flash– No.] So, what will the notification be? If it– That seems– Well, that's a little confusing. It won't pop anything up, beep, or flash so it's not clear exactly what the notification will be. Fine.	38
4:25	[Fixes the event configuration.] I guess I have to say "Commit", though we didn't talk about this before.	81
	[When do your tokens expire?] Mine expire at at, hello Mr. Window Manager, 10:50, and I assume a.m. May 2nd. OK.	195
5:30	[What Tasks are Defined?] [complains re: size of answer entry] And you know, let's see, let's just be curious. So, no matter how big I make, oh, yeah, it has this little dinky thing. [Slider to change sizes of subwindows.] Yeah. That's marvelous. Good. That's better.	55
6:30	[Suggests the numbers on the hoarded task entries should be labeled as priorities.]	82
	[Notices task names differ between the "Hoard Walk Advice" and "Task Information" windows and the Exercises interface.]	83
	[Providing Hoard Walk Advice.] So, the question I'm confronted with is which objects – not which tasks should be fetch…	218

12:00	[Please describe the "Weakly Connected Cache Miss Advice" event.] So, this is probably one of these– Control Panel things. Ah… Control Panel. Thank you very much. Event configuration. Indicator. Nnn… It's probably one of these– well, let's see. Tokens. Maybe it's a hoard event. Let's see. No. It's a Network. No. event. No. It's a Task. No. Weakly-connected cache miss. Well. There we go. OK. I didn't s… Oh. It does say "advice" in the name, doesn't it? So I guess I should have guessed that.	17
14:20	[Selects text in Exercises interface/window.] Oh. Now that– Those are good colors! That's. My that's amongst the– ah– really good color schemes I've ever seen. [blue highlight on pink background]	84
16:15	[Hits commit after fixing configuration of event.] You know, really, when I hit "commit," something should happen. I mean, like, this part should go away, or something should go away, or something like that. Having "com–", you know, hitting "commit" and nothing changes is a little disturbing.	32
	[Confused by typo in instructions.]	
	[Opens TaskInformation window.] You know. This little scroll box is pretty annoying. [moves around, makes taller]. [Note: Interface may have forgotten where the little slider box gizmo had been placed last.]	54 206
20:00	[Tries to edit program definition.] I wonder how I edit it? [clicks, then double clicks]	18 23
20:26	[Saves the modified program definition.] And now this thing should go away, but I'll make it go away myself.	59
21:00	[Resizes Task Definition window – not graceful.]	{4}
	[Tries to click on disabled– meta-information.]	20
22:00	[Types data definition pathname.] So, it would be nice if I had some confirmation here that there were, like, some number of files.	57
23:40	[Defining multi-path data definition.] And, I'm just going to skip down here, and come back and fill the flags [meta-information] in later, because that will be fewer mouse manipulations.	3
	Don't like having to hit <Tab> on that before I can click on the little buttons– that's counter intuitive.	20
24:25	Huh! That's interesting. This is above "New…" That's kinda cute. Not what I would have expected. Seems like "New…" should always be at the top.	7
	[Forgets how to delete a task, guesses backspace, gets it right.	62
28:??	[Defining Header Files task.] "Random Coda Header Files" contains– /coda/project/coda/alpha/include and /coda/project/coda/alpha/i38-6-mach. I guess I could have said @sys there, I don't know, I'm just following directions, /include-special, but if it were me I would actually put @sys in here, so let's do that, include-special, /coda/misc/c++/@sys/alpha/include and /coda/misc/tcl/common/beta/include. Good. N-A-Are these all actually include files? Include-special. Right. Now. I probably want to go back. Hello. Ah-I haven't ever hit <Tab> here is that the reason? [meta-information not enabled]. Um… Hmm… That's a little interesting. Maybe I have to… Ew… hidden modality! No thank you! How do I? Hello. OK. That one's all descendants. This one… You mean I can adjust the flags only of the last one!? That's gonna be a swift pain. Come on… Ah… Well. That's unpleasant, isn't it? OK. Good. Now let's– let's see where– let's	

see what if I come on– what if I sneak up on this? Kay… Good. NOOO! We've leapt right– OK. Thank you very much. I have no idea. Alright. Let's. You kn- Alright. Fine. So, let's just delete some of these puppies. Let's revert. There we go. OK. What is going on here? Thank you. /coda/project /coda/alpha/@sys/include-special. Ew… I don't know what <Tab> did that time. Hello. Um. Good. Alright. Let's um… revert. Cancel this puppy. And, try again. Playing by all the rules I can remember. /coda /project/coda/alpha/include. <Tab> All descendants. OK. /coda/project /coda/alpha/@sys/include-special. <Tab> And, we– Is this some, like,

29:30 secret way of telling me that there is no such file as @sys? i386_mach/ include-special. Yes! It's a secret way of telling me that file does not exist. OK. Now we're cooking. 36

[Data Definition Window.]
It'd be nice if this window were a little bit bigger, so I could see them all at the same time. [resizes ungracefully, but no comment made.] 54 4

30:00 [Saves definition.] 59
Alright, and let's save this puppy out. Okay. Good. No positive response. But, do we have, we have "Random Coda Header Files" [in Task Definition window.] OK.

Let's, let's see what the interface does when we're definitely too full [leaves old tasks hoarded].

[Chooses CV as 1st– goes to hoard it.]
Now, what's the– I cl- come down here, and click
[TaskUnavailable event causes system to beep three times.]
Ew. That was really interesting– whatever that was. Ew. So there's, like, sort of a way of rearranging the order of these things. But the interest– OK. Good. 262
:

35:00 I am <u>not</u> understanding what's going on here. I guess only the name is the part that you can click on? But, didn't I somehow get this. Who– Nelly! OK, so if I click on the name with the right button, it'll go down. And if I click on the graph with the graph with the right button, it'll go up. Of course, now it's not– who– that's, that's nice. Wouldn't have figured that out by myself. 42
:

35:45 Of course, it would be nice if the name hadn't been occluded by this, but that's OK. 85
:

Now, these things– so my cache space looks OK. I mean, do I have to make this update? I don't remember what it used to be. Oh maybe the– the, the cache space is still okay only because these are red? And these are green? Alright, anyway, I'll just leave these in, why not? I mean, 'cause after all they're lower priority. So these are the ones that should end up actually in my cache.

37:20 Hey! I wonder what this help thing does? OK. Good. Double-clicking. Ew… That's interesting. So. Is that true? It says double-clicking. Uh-oh. Alright. Well, how much have I crashed. [Help window steals focus.] OK. That's OK. Good. Fine. 13

I wonder why– Is this red just because some of it– some things are red. 259

[Watches hoard walk get performed to see things turn green, to watch the space meter, to see things get evicted.]

38:30 Well, great, everything fit in my cache and we're still 66% in use. So I'm not sure I believe in that. 86

[Lie: latex – bibtex – latex – latex, not just latex – latex]

Well if I'm supposed to report <u>all</u> state changes, then maybe I should go back and um… into the Control Panel, and make everything notify me. [goes into Event 87

	configuration.] Good Lord! There're gonna be stacks of these, aren't there [Sighs….] Well, I certainly don't want to go through and hack on all of them. Right? That seems like it would be unfair. There are gonna be hundreds of these things. So maybe I'll just be lazy and do only the ones that are– I mean– ar– aren't– for example, like repair– Oh! I guess notification seems to be on for a lot of these things. So maybe they're all going to notify me somehow. Space. Alright. Well, I guess we'll just go with it. I mean. This is an unusual task.	
	Excerpts from the tetris page. Alright. Yeah. Yeah. I know how to play tetris.	
48:26	[Fixing Coda Bugs unavailable.] I'm not really sure why it's now not hoarded because it was just a minute ago and something of lower priority is still hoarded. Maybe one of my colleagues has just updated files. Alright. So, I guess I will try a hoard walk. Why not. **Please don't.**	29
	So, the little hoard walk thing is yellow now. Ah… If it's yellow, I should look at it.	
49:35	[Tries help on progress-meter version of Hoard Walk window.] "This is the progress 'Help' text."	249
53:30	[Moves weak miss query window to center of screen.] This really would do better if it were here…	1
54:50	So, yeah, a button that would say, like, make every change… Whoa! Nelly! We have a pop-up here. Which would have been better off if it had been a pop-up here.	87 1
55:15	Everything's at 0%. I really don't like that 0% indication, but that'll do for now. : Well, alright, so we're not at least fakely disconnected.	8
56:50	[Determine urgency of Disconnected Miss query.] I guess this is critical because the Advice monitor [indicator] is red.	
58:30	Oh, wait! Wait! The network stopped being red. Great! So, it'd be sort– you know– [Sigh] I think that I would have– at least for me– I think I would have had a little bit more of a pop-up or maybe a happy sound for that.	88
1:00:10	Uh-oh. My Tokens are yellow. Well, I guess it's a warning… I'm not sure why this is only yellow. I mean, it seems pretty bad. I mean it seems like the worst possible thing that could happen on the Tokens front would be for my tokens to expire.	257
1:00:25	Oh– it's like little grayed out text. That's not what I would want. I would want… maybe nothing at all.	30
1:01:39	Oh! OK. So my Tokens are now red. Ah! OK. So this is bad.	257
	The interesting thing is that Reintegration is also red. Why is that? OK.	239

D.4.3 Debriefing

Time	Transcript	ID
	[User dislikes "All Tasks Needing Data"] So, I'm, I guess, the the– conflict there would be sort of why not, bring up, bring that up already expanded?…or at least have it expanded and on the screen at the same time.	71

So if it, if it had "All Tasks Needing Data" and then all of the children of that expanded, but not any further expanded than that.
That would be fine.

[Assignment– any time any thing happened– report it] 87
If that were really my assignment, in real life, then what I would want is a way to go into this window and say, you know, edit the class of all events to do something rather than having to go through and select each one of the 650 of them independently.

I wanted to use [parens]. 89

So, in general, there were a lot of things where I was given this three line window on four items. And, you know, that's just not right. 54
They're all sized for the IBM laptops. By default, all of those windows fit on the IBM laptop and they take up almost all of the screen.
… I would claim something a little different which is that, sort of, at any given moment, my focus is on only one of the three things that are on the screen all at the same time.
:

I mean, maybe I'd have to see it on a laptop to, to believe you. But, it just seems like… Yeah, I don't know.
So, would you rather have the window bigger and have to scroll through the window.
No, but like, for example, when I'm choosing… so, if th– if the claim is you can't have a– a– like, for the list of all so– several things… Two examples. One example is, like when I'm doing task definition and there are, like programs and files and subtasks. Well, I'm not really going to be doing more than one of those at a time, so putting a tab thing so that only one of those three would be actually visible on the screen at the same time would be fine. Right. My– I'm not dragging something from tasks to files. I don't <u>really</u> need to see both of those at the same time. Right? And so that gives three times the screen space to use for each one. OK. And then another example.
Then you can't see the whole definition all at once.
I don't need to see the whole definition all at once.
:

Then the other thing is for the list of files. I have this little thing which is trying to show me all the different sets of files that I've already described, like gdb or whatever, like a program. OK. Well, I mean, if the problem is that you ever really show me more than two out of the twelve that I have hoarded, then don't. Then have like a pop-up window. Right?
So is this in the program definition window?

This is some part of the task definition window. So I have, like, a task is a, some set of programs. Right. So if you're telling me that the set of predefined programs I already have, which is going to be, like, ten, you can never give me scroll bar room on the laptop for more than two of them. Then, that's not really useful. Then you should just have a button which says "Predefined…" And I hit that and up comes, on the screen, the full list of predefined ones. And I can like, checkbox the ones that I want and say "OK" and that goes away again.

Alert windows should pop-up in the middle of the screen. 1

[Tokens – yellow vs. red] 257
Is it really anything waiting? Like a read? Before a read would fail, you would tell me. Or the read would have failed when you told me… If you could stall the read, while you popped up the window to give me an opportunity to get the tokens, then, like, maybe that could be red and just not having tokens could be yellow. But, if as I

	suspect in real-life you would be failing reads quietly behind my back the whole time, then, you know, no that's not yellow.	
	Your configuration window should have that list of six little things. Right. And when you click on one of those, then its list of little friends should come up. That is, the configuration thing should look like the thing you're trying to configure.	162
	I think balloon help is a great win.	90
	[Discussion of building in Help automatically.] If one of the properties of every dialog box is the help text for it. Right. There's no reason why. You don't have to have any– what I'm saying is– it's stupid for you to have write any code having to do with the help system. The help system is just blobs of text. Right. And so when you're making the dialog box, you have two more fields– one is a little summary bubble help and then the other is the help text. Right. And it should automatically put up the help button for you and handle the event and so on. I mean. There's no excuse for not doing that. Um. So it shouldn't be any extra code for the interface designer. It should just be, like, a little bit of typing.	

D.5 N1

D.5.1 Tutorial

Time	Transcript	ID
8:45	Hey! I didn't want that to happen. Hmm… We have just requested the CodaConsole be started. Oooh… The initialization takes a few seconds so you will soon see a small window appear on the right hand side. That must be you.	
	[Color blindness/other cultures– until then please be patient. Hits <Enter> Key.] What happened to <Return>? Oh, it must be a– stupid windowing system. Piece of garbage.	
12:05	[Urgency Colors tab visible] Hmm… Why is this so complicated? If you click on the middle section. Well, why can't I just drag the color to the indicator light I want? That seems perfectly reasonable. Why is this thing in the middle… OK. I should just be able to drag the colors there– none of this pop-up box hookma.	91
13:00	**Will you mumble a little louder please?** Sure. **Thanks.**	
13:40	Alright. Commit your choices [for urgency colors]. I imagine that means ok… Is that what this stupid thing is. Eh. Commit. Eh. Eh. Commit. Commit. Commit. Great. Alright.	32

14:30 [Weak network]
Severed. At least one server. Wow! Multiple servers. Hmm…

Of the maximum Ethernet bandwidth?!? Well, why didn't, why isn't it the transport layer?

16:50 [double-clicked on Task indicator light] 1
All the windows come up in the left corner. Hmm…
[moves window and closes it and then reopens it]
Oh, good! Remembers where I left it.

18:00 [Task definition window]
Why do I need three subsections? Why can't I just have one? List of things. 54

Huh! Well I didn't want to do that! [clicks on predefined element] So it's moving them over. Let's look at the last main section – the one labeled user data. The list on the left shows… So I shouldn't … 23

18:50 [Hits "Delete" button.] 6
Yikes! They all went away. Hmm… Okay.
:
I don't see a "writing thesis" here. OK. Task's name "New…". Hmm… This doesn't seem good. Wow! I have whacked the "writing thesis". Cool!
:
Hmm… OK. Too bad I destroyed that. OK. Where did writing thesis go? Hmm.. Bye-bye.
:

21:30 Hmm... "writing thesis" disappeared. Alright. Where's undo? Nan, nah, nah, nah, nah. No undo. 92
:
Let me just get you back to the Tutorial. So, it asked you to double-click on the–
"writing thesis" task
It asked you to look at the– double-click on the "thesis" element in either
Yeah, but it went away– I killed it somehow
I know. That's why I'm trying to get you back on–
How did I kill it?
I can't tell you that. All I can do is get you on topic. Please double-click on the "thesis" element in either the predefined user data list. Alright. So the last screen asked you to do this. OK. So then this is referring. You're back on track. Even though you don't have a "writing thesis" definition.
I just have a "New"
Oh. Actually. You know what? Let me. Let me just… Turn around. Don't look. But don't kill your mike.
[Experimenter regenerates "writing thesis" task].
I don't know what's in it.
There wasn't much.
You're not looking.
Oh
OK. This is not what I wanted. What happened? Oh. This just ended up on top. So. Your windows are in a different order.
Mnn.
This is what this is referring to.
This one up here.
Yeah.

26:00 [Reading meta-information explanation.]
Well, 's "immediate children" only mean the first-level set of directories afterwards?
Huh… [keeps reading] Alright.

	[Reading meta-information on all descendants.] What does it do with the links?	93
27:30	[Reading about bovik's choices of meta-information.] Well, how does he know that? How does he know he won't have any problems? Can you put, like, how much memory it takes next each of them? That way I can know. Oh, if I select this, it's going to take lots of memory. I don't have to be– have file system e.s.p. Man, I don't want to remember the state of my computer– that's what it's for.	57
28:25	[Complaining about where ctwm has focus associated with cursor]. Ah, you stupid piece of crapola.	
30:01	[Exploring difference between <Tab> and <Enter>] Ooh. Very good.	
30:40	[Saves definition] How do I know it's been saved? Oh, OK. It showed up down here. Down here. OK. Need something to say whether this was saved or not. If it's not saved, will it tell me when I try an clos– oops! wasn't supposed to do that. Come back. OK.	59
33:45	[Entering program definition] It's a sin that anyone has to type in any pathname whatsoever. They should be able to select it. This is just– typing– just– pathnames is not for humans.	94
	[Save] [User saves program definition multiple times].	59
35:35	[Saves task definition multiple times] Why is this just all automagically saved? The save button is a total pain.	59
36:50	[Modifying name of task.] This is… This is not so good.	5
37:45	[Removing latex and xdvi from "writing with Scribe" task] Mmm… OK. So I don't want to do "Delete Task". That would be bad… Oh, of course, hit either <Backspace> or <Delete>. Mmmm, which one, which one, OK.	6
	[Still removing element] Can I just drag it out?	6
	[Hoard Walk Advice request arrives– lots of blinking] Uh Oh! All hell's breaking loose.	9
54:38	[Reading Space Help Window] Ha! Ha! Poor guy. [Reference to contacting Josh Raiff].	
55:00	[RVM problem has been solved] Help button was visible but didn't update.	95
56:??	Yeah, but I want it to tell me before the expire.	260
	I was just going to say mumble louder when you started talking.	
59:??	So, is there a button to turn off all the sound, all at once, or do I have to go through each thing? Hmm…	87
1:00:??	[Token Expiry event] But they said they were going to expire tomorrow.	

D.5.2 Exercises

Time	Transcript	ID
4:15	[Searches for "One or More Tasks Unavailable" event]	17
6:??	[Hoarding Details] Hmm… Tasks currently defined. Well, there's a lot of them defined. Which of these are hoarded? Editing. Tasks. Eh. Alright. Which of these tasks has highest priority? Better get that SOSP paper out. SOSP16. The lowest? I was just there, is editing.	
6:45	Which, if any, are completely available? Oh. Which of these is hoarded? Well, OK, so editing, OK so editing is completely available. Things being hoarded are editing, letters, SOSP16, and Darpa Grant. OK.	219
8:50	[Hoard Walk Advice Request] Cost. 2070 seconds. Gee. That's, um… ah… There's 3600 seconds in an hour. So this is, uh, 3/4^{ths} of an hour. Alright, let's take a look here. Recommendation letters–	96
9:30	looks smallest, so maybe I want to suck those across first. So, editing is already in. So let's fetch the letters. [mumble] OK. So [mumble] let's look at SOSP16. So this'll take 83 seconds. So that's– a minute and a half. And the, ah, Darpa papers– oh– there's a bazillion of them. Nk. But I only need probably the tex file or the dvi. Let's see. He wants me to read it. A colleague asked you to review a submission for SOSP16. So let's see. Either postscript or dvi. DVI is the smaller. So if I just want to read it, I'll just get the dvi and then the letters of recommendation. Those seem to be.. the easiest way to go. OK… OK. I'm trying to fetch the smallest amount of, um, data	
	to do my task. I selected the SOSP dvi file because I just needed to review it and it is small and I selected the letters, um, because they are small. What about the programs? So, I think the programs are already all selected. I mean, that's what the hoarding cache shows. Let's go take a look. Um… Tasks. Yeah, see editing is already all the way in the, um, in the, in the thing.	228
	So we won't, we won't select any editing. So it looks like I can just suck down the letters, and the ah, and the ah, SOSP dvi file. Ah. I wonder if I have the thing for viewing. Am I smar– Am I that smart? Let's see. Um… Hoard. No, I don't want a hoard walk. I want Tasks. Tasks. Um. Recommendation letters. Well. Let's take a look here. Um. Xdvi. Oh good! So I have an xdvi viewer. Oh. It's in– in a.. In writing I have an xdvi viewer. Mmm… Well, so it looks like I need to get writing down. Let's see what editing has in it. Editing only has gnu-emacs. Hmmm… OK. So that, that's OK. So it, it looks like I should also set up to get the writing across.	
13:30	**Don't puzzle too much about the xdvi viewer.** OK. **OK.** So, I won't puzzle too much, but I'm going to change my choices now. I'm just going to get the tex file, 'cause I can edit that with, uh, emacs. Alright. So, let's ah, SOSP16. And let's not get that one– let's get the tex file. Alright.	128
16:15	[Searches for Miss Events] The "Weakly Connected Cache Miss Advice", um, is I think a thing that the hoarder brings up. Is a prompt that the hoarder brings up to figure out what to download. OK. I don't know, "Disconnected Cache Miss Advice". And their configurations. Tasks. Ah. OK. Repair. Reintegration. Hoard walk. Ah– Advice. Oh, well, there's a nice thing. Oh– OK. And it is set to critical… :	17

	Alright. Therefore I must have to save this. Commit. Commit. Commit. [Fix Weak Miss Event.] Commit. Commit. Commit	32
21:40	Hey! Where's, ah, programs you need to build coda will be defined as "Building Coda". Hmm… Well, look at all these things are sucked up all the way. How nice. Well, I don't see a "Building Coda." That doesn't seem right. Must be a subtask.	18
22:00	Let's go see. Ah… "Building Coda"! Ha. Ha. There he is.	
22:30	Programs. "Building Coda". Who– Who– Twice. That's clever.	22
	[Typing pathname] And w– want to add /coda/misc/gnu-comp/i386_mach/omega– Man! The Marquis de Sade came up with pathname– /gdb. Save.	94
	[Creating user data] So, let's, um, create some user data here. So let's call this, um, bug task. I assume they don't have a bug task here. Yeah. It doesn't look like they do. OK. I want. I want to <u>select</u> this pathname. Bad, bad, bad. Alright. /coda/usr/bovik/src/venus. Do you <u>know</u> if you're a directory? Why aren't you a directory? I want you to suck it–	94
	Hmm… It must not be a directory. Mmm, that's too bad. /coda/usr/bovik/	36
24:??	**Check for typos.** Coda– code– coda. OK. Let's look at this guy…	
	I wish I knew how big these things were. I wonder if I'm going to have problems with my cache now.	57
	This is called our "storm work". We save him. Save him a couple more times just to make sure.	59
27:25	"Storm work"– we want to– #1 [beep] priority [beep-beep]. Alright– You're all mad at us now.	
	Uh, oh– I think I did the priority too early.	
29:00	Uh. I wish I had pathname completion. I wonder if we do? 368 <Tab> Ha… Yeah. No pathname completion. Alright.	94
	Alright. Save. Save. Save. I guess he's saved.	59
	"Writing with Scribe". Go away. Up. Well. Ah. Ah get out of here. Let's change your name. Scribe. OK. Uh! Oh, go away. Ah… Delete. Ah… Well, we'll just do that one. You go away. How do I get rid of him? Eh,.. we won't do that. We'll just	6
34:00	play it safe [Tempted to use "Delete Task" button]	
35:00	[Defines data definition named "New…"] Mmmm. Save. OK. So now– I need, um… [Looks for definition] Hey. Where'd it go? Interesting. Did I not name it anything? I must've not named it anything. OK [User saved definition under name "New…" and system did not complain in any way!]	97
37:45	Oh, that's right. So I gotta make sure I gotta run these things a couple times so that these guys know what's going on.	
39:15	Oh… well, it got everything. D'I get everything? Well, it got everything.	
47:45	[Looks at Help window to determine why Task beeped and CV not available] Well, that help isn't helping.	252
55:??	[weak miss query] Told it to fetch, 'cause it needed to tex the intro report OK. But now we have advice went green. It must have gotten the report.	253

55:50	Network is red. I must have– [mumble] tripped and hauled out the network cable. Reconnect the network. Help! [Clicks Help button] Great. It doesn't tell me what's goin' on. Well, what happened to the network? Geez. Come on. Tell me what happened to the network.	250

D.5.3 Debriefing

Time	Transcript	ID
	Under Control Panel, right, to figure out what events are going on. **So, when I ask you about the weak cache miss advice event.** I'd rather it just have all the events in one list.	17
	[cache management for hoarding] Um. So this right here. I go to Tasks. Right. And it tells me how my hoarding is going and what hoarding is happening. Alright. So I can tell whether– you know, if I have all my tasks set up right– I can tell whether I can leave.	
	So the biggest one [comment] I have is that when I go in here and define stuff. Um. When I push <Tab>, right, it takes me somewhere else. To me, it should do filename completion. Alright. So, I hate typing in filenames. And if I can't drag a file directly in there from the interface, so on the MacIntosh, I'd be able to just drag a file from the finder into here in a normal, kind of, Mac application. But in Unix, you don't do that, so I'd rather, I'd rather have file completion here, filename completion? Cause that's how I live my life. Right? I even set up my directories and everything so at least the first two characters are usually unique. [Experimenter discuss plans to use PATH environment variable] [Agrees that would be nice.] [Filename completion is orthogonal to PATH environment variable.]	3 94

D.6 N2

D.6.1 Tutorial

Time	Transcript	ID
5:45	[Reviews Intro7 screen]	
7:10	[CodaConsole pops up] We have just requested that the CodaConsole be started. Alright. I just saw something	

	pop up. Control Panel, Tokens, Space, Network, Advice, Hoard Walk, Reintegration, Repair, Task. And there's an indicators window bar at the top. [Not sure what is meant by a "window bar at the top". There is no title bar on the indicator lights window.]	
8:45	[Note that there is a "Help" button on every screen] OK. (So, I) don't really have the console interface up right now.	45
11:15	[Hit "Commit" button for urgency colors tab] And then I hit "Commit". Oh. OK. And then I have to close it. [Seemed to expect the "commit" button to do the "close."]	32
13:30	OK. So let's see. A task is a set of files and directories. So there must be some way to group things into a task and then name it.	
13:50	And I notice that when I move my, uh, cursor around on the, uh, Control Panel here– er, not the Control Panel but this indicator panel, there's a little gray bar that appears to show which one I'm selecting– before I click.	
14:30	[Task2 describes bottom third of Task Information window as showing those tasks that have been hoarded by the user] And nothing's been hoarded by the user right now.	
16:00	[window has 3 main sections– description of Task Definition window] OK. So Tasks and Subtasks are, um, the same thing I guess. Or any Task can be a Subtask of any other Task, or something like that.	211
17:20	[The definition for "writing thesis" contains…] Yeah. I guess at this point I'm still a little bit confused about the relation between Tasks and Subtasks since there's, uh, um, some of the same labels are in each. I guess it means that, um, a Task can be a Subtask or something as well.	211
19:00	[Looking at Data Definition – before meta-information explanation] This directory, and I guess the "immediate children" would be the files in that directory.	
19:45	[Resizes the Data Definition window] [User makes no comment about the ungraceful expansion…]	{4}
20:20	[Meta-information explanation– of "none"] So I guess you'd have the listing available and that's it. :[continues reading] And is that recursive?… [continues reading] Ok, so it's the entire, ah, recursively the entire tree.	
23:00	[In Data Definition Window] I see there's a [navy] blue highlight around, ah, the path I'm going to define now.	
	[User attempts to use xterm running tutorial] **Can you iconify that one again? I'll give you an xterm. Just not that one.**	
	[User types path and hits <Return>] Hmm… Is /bin not? It created a new one. Oh, I see. So why did it? Yeah, let's see. Then when you hit either <Tab> or <Enter>, the meta-information are will become enabled allowing you to choose the appropriate meta-information for this entry. No, but it also gave me a new one. But I guess, yeah, it's not gray anymore. OK. I thought it would maybe just pop over here and not give me the new one, but I guess I might want to use "none" as a default.	3
27:10	[Tried <Tab> and <Enter> to move around the meta-information area.] Does <Shift><Tab> work in reverse? No.	3
27:30	[Saves Data Definition]	59

	I guess that window doesn't go away– it's just saved it somewhere under that name– "grant proposal."	
	Alright. Yeah, I guess I was, ah, expecting the "save" would make it go away.	59
29:00	[Re: automatic program spying] Oh. Interesting. So it has to, um, watch it run for awhile. "By making this distinction between a program data and user data, we can let you share program definitions among different tasks. Because this–" OK. So. I guess if a program uses, a, file that's just a user data file and I put it in a user data set, then, um, it will ignore it. If I hadn't put it in a user data set, I guess, ah, it, ah, wouldn't ignore it and would figure out that that's something that I need, ta–, that needs to be included, ah, in the program definition.	
30:35	[Defining a program] /coda/misc/bin/scribe, and if I hit <Enter>, I should get a new one, and I do.	
32:45	[While trying to delete "latex" program from "writing with Scribe" task, user hits "Delete Task" button.] Oh, man, I think I just deleted the task. (Don't) hit <Delete> or <En, ah, <Enter> key. Oh, I'm sorry. <Backspace> or <Delete> key. Alright. OK. Yeah, I guess, yeah,	6
33:00	maybe I was expecting a button or something for deleting programs.	
33:45	OK. So I didn't have to hit "Save As" even though I started with that and changed its name. Hmm… OK	60 5
34:40	[TaskUnavailable causes system to beep three times.] Hmm… Something just beeped at me– sounded like from behind me. Um. And there's a red thing. And task is– I guess bad things are now happening. Things are beeping and things are turning red. Um. [Reading] Now move on, move the mouse down to the hoarded task list– when you right click, OK, repeat for "hacking advice" and "hacking venus" tasks. Alright. [mouth noise] So, click or select and it's blue and I come down here and right click. And I added that guy. One. Writing thesis.	261
35:15	Two. Hacking advice. Oh– it's just, ah, counting the number of hoarded tasks I guess. Right click. There's three. And each one of them needs that much space or something. "You've probably noticed that your machine beeped three times and the task indicator turned red. The interface has just told you that a task is unavailable. This is because your newly selected tasks have not been hoarded yet." Ah-ha. OK. "We'll get that shortly." And so, I'm not sure what this means yet. This is the total– I'm using 70% out of my total cache space and here I'm using 90% out of something. I guess it knows that "writing thesis" is a task that needs 46 Meg worth of stuff or something. And I've got 90% of that 46 Meg hoarded already. I don't know. Let's see. [Goes back to reading explanation].	82 268
	[Reads explanation of priorities.] Ah! That's the one, two, thing	82
	[Reprioritizing explanation] So, I guess, like, if I wanted to change, ah, "hacking venus" to higher up, I would just selected it again and drop it. And I guess this one would go away and it would appear in some new place up here.	
39:00	Ew… Everything's all flashing now. [Advice blinks red.]	
39.35	So right now. I'm getting no advice and venus needs some advice.	
39:45	So right now. The network is weakly connected, so it's yellow. Advice is red because there's some urgent advice. And task is red, um, I guess because this task, ah. I don't know, some task is getting screwed up because it can't grab this file– or something. Or is worried about grabbing that file over a low bandwidth.	261

41:30	So, yeah, if you're away from your disk for an hour, then it might as well go ahead and grab it.	
42:30	[Weak miss timeout prod] Yeah. I guess the two "No's" in a row momentarily confused me 'cause [mouth] it seemed like two things both saying "No" but then I saw that they– they say different things.	98
44:30	Ahhh….! Yep, I'm getting advice [Hoard Walk Advice request arrived]	
44:55	Oh. And it stopped flashing. It was flashing and it just stopped flashing. So I guess maybe the flash is just to attract some immediate attention and then it just goes solid.	33
45:30	So, I guess I can get advice from both Hoard Walk or Advice in the event that the advice has something to do with the Hoard Walk.	10
47:20	[Hoard Walk Advice window] And it looks like it's gonna be a tree– it looks like, like a little tree widget gizmo.	
48:30	[Note that the costs do not add up.] That's true. There must be some overlap.	
49:55	[Expands each of the nodes; sees Editing/Building Coda in multiple tasks.] I wonder why these are in, ah, italics and these are, ah, not italics. I guess presumably italics means shared perhaps. There's "Building Coda" and if I selected on– yeah, I guess that must mean anything shared and the non-italics are the unique ones.	
50:40	And task is now flashing red. Oh, and the Hoard Walk Informat– this thing came up from– I didn't notice this come up, but it popped up somewhere.	
51:00	I wonder why Task is flashing red and then stopped. Huh! So, I guess– ah– 'cause it was red before 'cause not all the tasks had all the files they needed	33 261
51:45	[Space Information] Now let's see. Is that available or used? … Ah… "The window shows the status of the available cache. The available disk space on the partition of the local disk where the Venus cache resides. And the available RVM space, an internal data structure." OK. "Should any number exceed a reasonable threshold, the instructions will tell you what corrective action to take." So I guess we're <u>using</u> 16% of the local disk, is how to interpret that not that there is 16% left. Yeah, that's because it– as it fills up, the bar fills. ["Notice the Space Information window disappear and reappear."] I didn't know– I guess it just went dung-dung, flashed really fast or something. Excellent.	271 280
53:20	OK. The cache is filling. Be careful not to… [Note: User went straight to the bottom half of the Help window on his second exposure to it.]	280
54:40	I guess, ah, maybe Tokens would start becoming yellow when it's getting close to expiration and red when it has expired.	260 257
55:15	Let's see. Is there an events thing [indicator]? [Looks at indicators]… So I guess we're going to be bringing up Control Panel. What's a configuration? Yeah it says that.	
56:40	[Discovers trigger descriptions.] OK. That's pretty nice. I like that.	
58:15	Read disconnected… So I guess that means that I can write back to the server, but I can't read or something. Oh yeah OK. It's going to tell me. [Reads trigger description.]	

D.6.2 Exercises

Time	Transcript	ID
3:30	["One or More Tasks Unavailable" event] Let's see. Under what conditions will the "One or More Tasks Unavailable" event occur? Uh… Let's go to, ah, Tasks. Um… Ah. Let's see. Where was that dang thing? Was it under Control Panel? Event information– yeah, OK. Event configuration. Um. One or more tasks unavailable. Um. I guess that's tasks [Finds it]	147 17
5:40	[User uses the sliders widgets to see everything.]	
6:40	So that's why this thing is red– task indicator. 'Cause three of them are out.	
7:15	Oh. I'm getting Advice and Hoard Walk flashing at me.	
8:15	OK. So, Hoard Walk. Ah. I think I can get Advice from clicking on this guy as well. Yep. Hoard Walk Advice. So, um… Let's see. So what happens when I click on Advice– just for the hell of it. Hoard Walk Pending Advice. That probably brings me to the same screen. Both recommendation letters and papers, I assume, are going to need editing– need the editing guy. Yep– So no matter what I do I need that stuff. So, um, if I'm going to do anything, I need those. Then, and that's going to take me 7 minutes. : [User chooses biggest file (.ps) because he knows how to read it.] I don't remember all the tex and dvi stuff. So, even though this is, like, the biggest file, it's the only one I happen to know how to read. Ha! Ha! Ha! So I would pull that guy down and look at it. Maybe I don't care about the diagrams. I don't know. Do I need the diagrams? Eh… I don't know. :[letters of recommendation] Um. Eh… How does that change my time? Oh– hardly anything. I mean, really, ah, everything else is small… it's like the editing guy is the big guy. It takes a big hit. [Discovers tex-mode and decides he must be able to read paper as .tex file so he doesn't need ps.]	
13:15	Number of objects, -2. I don't know. Some weird thing happening. I'll ignore it for now.	99 124
15:45	[Describe Miss Events] So I brought up Control Panel to look at the events. Uhm. So, ah, "Weakly Connected Cache Miss Advice". Is that all? I think that's Network stuff. No. So what else? Space? Advice. Oh OK. Makes sense.	17
18:43	[i386_mach box] Ah... second. OK. I've never used a Mach (box?), so I'm not really sure what that means. But 386 is a relatively weak processor, so I guess a not very powerful machine.	
20:20	Let's see. We don't have a fixing coda bugs thing yet so I guess we'll make a new task.	
20:45	[Looks for "Building Coda" under tasks] Do I have a "Building Coda"? Oh– That would be programs. Right. "Building Coda" is programs, not a subtask. Editing contains gnu-emacs. OK. So, let's close that guy. So that would be the same thing as just including gnu-emacs as a program would be to include editing as a	18

subtask, but I'll include editing as a subtask seems, ah, slightly cleaner.

23:05 [Creates Coda source, data definition]
/coda/usr/bovik/src/venus, tab over, and I want the immediate children. I guess I'll check to see if there's like subdirectories I need, but… {57}

24:20 [Attempts to click on meta-information without having hit <Tab> or <Enter> first.] 20

25:40 Coda bugs. I'll save. Did I save? I don't know if I saved. Um. I guess I'll click save anyways. 59

26:40 [Interesting header files]
So I wonder. Let's see. Source files. Would I want to include them in my "Building Coda" programs? I think I– I thought I would want to put them in my, ah, user data section. Hmm… So I would actually want to make, like, a, ah, "Coda includes" user data. Mmm… Coda headers. Building Coda programs. I'm a little confused about 100
the notion of putting these header files in with the programs instead of putting them in user data. No. I'm going to go ahead and, so when I was looking from home, so when I fix Coda bugs, I want to have those header files around too. So I put the bugs in the source. So now let's, ah, make Coda headers and I only want these few.
:

27:50 [User attempts to use arrow keys to move around the meta-information area of the screen.] 101

29:15 [User adds headers to bug fixing task.]

32:20 [Attempts to delete selected object from contains list using "Delete Task"]
Ew! Dang it! I deleted, ah, the writing tasks I guess. Rats! I wonder if I– I was 6
meaning to delete this, ah, recommendation letters that I stuck in fixing Coda bugs. 62
Oh well. I wonder if I say– if I just don't say "save". Oh– what if I say "Revert"?
Probably not. I think it's gone. What if I don't say "Save"– I just go boomp. No. {92}
Poo. Alright.

35:50 [Prioritize these tasks.]
OK. So I see. If I separated the header files– Right now they're stuck in the fix bugs thing. So what I really want to do maybe is put them in a, ah, separate thing that I can give a low priority to.

36:?? [Deletes selected task– remembers not to use "Delete Task" button.] 6
I hit the <Delete> key. Hey, Ha. Ha. 62

37:00 [unhoarding tasks] 102
Yep. Selecting them and deleting works like I expect.

37:20 [TaskUnavailable event causes system to beep three times.]
OK. It's beeping at me because it hasn't, uh, all those things I need to do a cache walk, or whatever that's called, a hoard walk in order to get everything in there. 220

And "writing CV" is the highest of all. I wonder if I can slip it in there. No. OK. 42
Hmm… I wanted to stick it above the top one, but ah. So I'm going to delete "fixing coda bugs" and try to stick it between these two.

38:00 And I guess all of them, it's telling me, are 37 Meg. Uh. All of these tasks take 37 Meg. And I probably have about 30– less than 33 left 'cause I'm at 66% of 97. So, something's gonna get left behind– that's for sure.
:

38:25 Ah, except I'm at 64% of each of the 37– Ah! I don't know. What I'd like to see, I 268
guess, maybe is something telling me, um, for all of the hoarded tasks I have now how 273
much more cache space would I need to have all of them in there. So that you can, 15
you know, see exactly where– who's gonna start getting left behind– like what task

	isn't gonna end up having enough stuff in it.	
45:05	[User remembers RVM problem from tutorial.]	
48:40	[TaskUnavailable event causes system to beep three times.]	261
	Basically, it doesn't have any of the stuff for "fixing coda bugs." That's weird… I guess that's all that means. Let me look at, ah, um, Control Panel and see what, ah, is indicated under Tasks. "One or More Tasks Unavailable". So, yeah, it must be the	207
	"One More Tasks Unavailable"– beep and critical. OK. Well, I guess I would have to do, um, one or more tasks that have been selected for hoarding become unavailable. Now why would they become unavailable? OK. Let's see. If it was available, what	29
	would make it become unavailable? … So, I guess I would just do a hoard walk. **Actually, please don't do a hoard walk.**	
50:00	Then I saw another change, which is this hoard walk guy flashing up. See it's yellow. So yellow means it's doing one right now I guess. Starting one. So it's like a warning level thing. Ah– No help on the hoard walk information– Oh! OK. That's where it is.	
	Down here. "This is the progress help text." [Hoard Walk finishes.]	249
52:30	Ew… The Network just went to pot.	
	:	
	[Tries Network Help to determine what to do to fix the problem– help doesn't suggest anything.]	250
54:??	[Weak miss advice.]	
	Let's see. I don't remember what it is I'm trying to work on right now– oh yeah I'm working on my, ah, thesis. I'm processing it through latex.	149
55:??	Ah… we just went off the air– zero! Alright. What– What can you <u>do</u> in the event of a– is it, like, do I already have, like, the stuff that I need, ah, let's see. Yeah. If these are what I'm working on, except what I really said I was doing was working on my thesis so I guess I don't have those hoarded right now. So, if I had them hoarded, it	
	wouldn't matter that the network just dropped off. And I could ask it to hoard it, and then, ah, Do I already have a, ah, "working on my thesis" task? No, I don't. Pooh. So what would I do in this event? I guess I could ask it to hoard it, and hope that when the network came back on, that I could then grab it and then if the network's being flaky. Neh. I don't know what I would do in this situation. Alright.	191
58:20	[Disconnected cache miss event.]	103
	So that seems to indicate that even though I haven't hoarded it, um. Coda is going to, ah, try to keep track that of that was an important file to me and grab it for me in the future. So that I don't have to explicitly define a, um, explicitly define a file, I mean, explicitly define a task.	
	[User doesn't know bovik's password.]	
	[Submitting password takes excessive amounts of time to return.]	104
	[Doesn't know abount reintegration.]	239

D.6.3 Debriefing

Time	Transcript	ID
	[What to do if you find yourself weakly connected? **Define a task, hoard and disconnected. Call the operator.** You define tasks even when you're strongly connected. **Not in the past– pmax binaries weren't in Coda. Perhaps in the future.**]	

D.7 N4

D.7.1 Tutorial

Time	Transcript	ID
	When you name things, do not use funky characters. Stick to the alphabet. There is a bug that causes a catastrophic failure if you use a certain funky character. And by funky character, I mean anything like this [points to numeric keys]. Okay. Just use the alphabet. Dashes are okay. Like single dash. This one. [points] This is okay. Thank you.	
	[AFS outages.] Yes, that's frustrating.	
	Would you mind reading a little bit more out loud? OK. **Thanks.**	
8:10	[Choosing urgency colors.] Mmm… Uh Too Dark! Hello. Maybe dark for normal is good.	264
	: I guess that's as light as red gets… Hmm. But now the warning is much lighter than the red. Well… I guess that's OK. Hee. Hee. Maybe if I make it blue, it would be better. No I think I'll remember yellow a lot better than blue.	266
	[Notice Network indicator is now yellow.] What if it wasn't yellow that I changed it to?	106
15:20	"If the pathname is a directory, the definition also contains some meta-information: none, immediate, or all descendants. If the meta-information is set to none, then only directory will be included." OK– contents, but not the children– children directories. OK– Great. Um. "Immediate children, then the directory and its immediate children will be included." … "Look at the directory contents and examine any children." Oh. OK. So, that is children– [mumble] You can list it, but not read anything. OK. So	

	there you can list it and read anything.	
	Yeah, if you had links in there, that could be really big.	93
18:40	[User successfully uses keyboard accelerators.]	
19:55	[Automatic program hoarding – rereading instructions in Task13.] I guess because they are already there.	
21:40	[Types in pathname. Hits something (<Backspace> or other key near <Return>). The entire pathname then disappears.] /coda/misc/bin/scribe. Can't type today. Ew… Where'd it go?	107
24:20	[TaskUnavailable event causes system to beep three times.] Oh! Now what was the beeping?	261
26:00	[Reprioritizes a task.] Hey! It worked.	
27:00	[Note that you are weakly connected to the Coda servers.] That must be the Network thing.	
27:35	[Two main sections in Advice Information window.] Ah! So the advice goes two ways.	{115}
28:30	[Go ahead and fetch if user doesn't answer weak miss query.] Unless it costs money.	
31:05	[Hoard walk advice request.] Oh, there's things blinking there.	{9}
32:05	[Hoard walk Advice window.] You can also see an area labeled network status. This area shows you the average network bandwidth as a percentage of the max– maximum Ethernet bandwidth. OK. Eh. That almost needs a log scale.	50
	You can compress the node in a similar fashion. What? Oh! Nnn… OK. I see.	
34:30	[Expanding nodes to see what's there.] Boy, these things go down forever, don't they? : I like the minus sign. Cool! Ok. The minus sign is nice.	
35:15	[Space indicator will soon indicate an urgent problem.] Ha… I feel like I'm on Apollo 13 here. [Reads Space Help overview. Then RVM explanation.]	
36:30	[Space problem solved. Space indicator will indicate a potential problem. Rereads the Help window overview.] I already read that part, didn't I? [Moves on to explanation section.]	
38:10	[Notification of events.] It could be just like AFS and give you an error when you try to Save when your tokens are gone and you have no idea what causes it.	
	You should now be looking at the Event Configuration tab of the Control Panel. Did I forget to do something? Hmm… I must have.	
39:15	[…whether or not the bell should be used…] Oh, I hate bells.	
	Under the Advice indicator, please select the– wha? Hee. Hee! OK. Advice indicator. There.	108

D.7.2 Exercises

Time	Transcript	ID
	[Experimenter reminded user not to use "funky characters".]	
2:25	Uh. There's no interface up. Something's wrong. Let me. Let me… Hmm. **[mumble] There's now an interface [it showed up in the wrong "room"], but you missed that first question.** Hmm… **Did you miss a question? Let me check if you missed a question. The– so the first one was "please choose colors for the urgency levels** Oh, colors, OK **Um.. pick colors you can see and remember. If you are happy with the default colors, you do not need to pick new ones. OK?**	
7:20	[Hoard Walk Advice Request] [The Advice light turns green as soon as user opens hoard walk window.]	120
	Cost in seconds… Seconds is kind of a small unit for this um. Editing. Don't we already have all of editing?	96
	[User attempts to use xcalc unsuccessfully.]	
	[User has no difficulty finding Miss Events.]	
	A blizzard is presently hitting Ohio. Oh… It's May…	
24:05	And you also need gdb. Ah… I need to make a new one. gdb. Contains, ah, /coda/misc/gnu-comp/i386_mach/omega/bin/gdb	
	[User Data for Coda Sources.] And I think I probably want the "immediate children", because otherwise I can't modify anything. OK. Although it's possible I would want "all descendants".	
28:30	[Header Files Task]	100
	Let's fix this task. Ummm… Um. Hmm. I don't know whether to put them in programs or user data, but I guess that, ah, maybe they go in programs. OK. Which means that I would, ah, … yeah, they must go in programs because that way it'll sniff out everything they need. But that's only if they run. Well whatever, I'll put in	
29:30	anyway. Well, they're not executables though. Um. I'll put'em in user data. That sounds good. Yeah. OK.	
	[Creates header files data.] And, some include directories have subtrees, but I'll assume these don't.	
31:30	[User adds header files to bug fixing task.] OK. Save that. And done. You need to write your CV before Tuesday. Hmm. I wonder if headers should have been a different task. Oh well. Too late now.	
36:30	[Prioritize these tasks.] Yeah, I think header files should have been a different task. Let's see...Well that's not too hard to change.	
37:25	OK. Coda bug fixing is gonna… I guess I should take out these old ones, too. I wonder how I do that. There we go. [Figures out how to unhoard without consulting Help.]	102

	[TaskUnavailable event causes system to beep three times.] Oh– Now it's complaining that I don't have all of bug fixing ready. Right. Please request that a hoard walk be performed immediately. OK… Hmm. Well, whatever. Let's see. Finish Hoard Walk. Hoard Walk Advice here. Hmm. OK. [User never completed the prevous hoard walk advice request. Thus, the request remained when she attempted to start the hoard walk. She did the most reasonable thing– clicked the Finish Hoard Walk button. She seemed somewhat puzzled, but not terribly so.] [User reads incident report directions while playing.] [User closes incident report with ☒ rather than "OK".] I wonder if space should still be red like that. : Oh, that went off. I wonder if that's an event.
52:20	[TaskUnavailable event causes system to beep three times.] Mmm. Something beeping. OK. Uh. So, what is the problem here? Probably that you can't write the CV. Ah. Let's see, the "writing CV" task is not in the cache. Ah. Ah– I guess you could fix this by doing a hoard walk 'cause there's still some cache space. Although, not enough. Mmm… Hoard Walk is yellow. Why are we yellow? [User took a long time to answer the Task Unavailable report so the Hoard Walk Begin and End occurred almost simultaneously.]

D.7.3 Debriefing

Time	Transcript	ID
	[Questioned about pathname disappearance which occurred at 21:40 of Tutorial.] [Questioned if she had verified @sys!=i386_mach. She had not– just checking to see if /coda/misc/bin existed.]	

D.8 P1

Pilot user P1 was not recorded on video or audio tape. For this reason, there is no transcript of her session. Her primary purpose was to critique the tutorial. Her comments were reflected in the version of the tutorial used in subsequent runs.

D.9 P2

D.9.1 Tutorial

Time	Transcript	ID
	[Playing with Event Configuration] Ew, Cool!	
	[Examining Event Configuration for "Operating Disconnected"] …Operating Disconnected. So I get notified. [mumble] urgency critical, which means red. No pop-up. No beep. But it flashes… Now flashes happe… I don't know what flashing means. Flashes… The network in…. it must, must turn this on and off. You know, so like blink. Maybe. Attract your attention.	221
	[Space indicator changes to red] "…an urgent problem. If you open the 'Space' indicator window…" Ew, it does, how 'bout that– cool. "…you'll notice…" That's what flash must mean. OK. Flashes between green and red. OK. Wonder why green? Anyway [continues with tutorial].	9
	[Description of Meta-information] "…be able to look at the directory contents, but not at any of the children." Child directories must be. So I can see the files there, but not the children. Alright. "If the meta-information is set to 'immediate children', then the directory and its immediate children will be included. This means that you'd be able to look at the directory contents and examine any children." Maybe I was just wrong.	
	[User clicks "Save As" button for window below the one he thought he was saving.]	

D.9.2 Exercises

Time	Transcript	ID
	[Please describe the "Hoard Walk Pending Advice" event and its configuration.] [Reads question] [rereads questions] So I have to get to that I guess. So let's take a look at it. No, that's the advice– that's the wrong one. It was in… No, it wasn't Tokens– what was advice? No, it's not advice. It was. It must have been Control Panel. And-it-takes-a-long-time– Event configuration. So we're looking for hoard walk… pending advice. OK. Please describe this event and its configuration. OK, con-copy. No– too bad. This event is triggered when Venus has a hoard walk temporarily waiting for advice…[describes configuration].	108
	[Please describe Miss Events] So, weakly-connected and disconnected… I think are both Space. Is that true? No, they're probably Network. Operating strongly connected. No. It's… weakly-	17

connected cache miss is in advice. So, I remember that– but not exactly.

[Please describe our connectivity to each of the servers.]
Must be strongly-connected; otherwise, we wouldn't have a, um, little thing there.
[double-clicks on Network indicator]

[Hoard Walk Pending Advice] 155
Uh. Hoard Walk. OK. It doesn't say, what, um…, it's not asking for advice. That comes under the advice thing and nothing comes up. So, wait a minute. Let me. I'll close all these things. OK. Has requested advice. Please examine the request. Decide.
[double-clicks advice indicator]
There's no advice. [clicking] I need help. There's no advice here. [double-clicks on Hoard Walk indicator] Hello. Hello. Hello? 156
16:00 **Harry?**
Yes, I need help.
Experimenter is on the phone with lab administrator trying to figure out why the sound is not audible from monitor in the equipment room.
What's up?
It says to um.. uh… Just a minute ago you requested a perform has requested advice. And there's no advice being requested.

Well, but this is the, um, hoard walk. So the hoard walk advice comes in under the hoard walk line.
Oh! OK.
OK? Make sense? 155
Except I don't see any advice being requested here. OK. I did look here, and I didn't see any either. But maybe I'm looking in the wrong spot.
Try, try hitting Help.
OK, Hoard Walk advice… [reading from Help window].

[Mobile 95 Paper Task] 157
That seems silly to create a task for one thing.

[Save Confusion…] 158
Oops! I need to go back. I didn't save it. [mumble] Writing and thesis. So, it saves automatically if I close it. That's interesting. OK… Without even telling me. That's, I guess, a feature.

[Hoards a task that's unavailable– task indicator beeps.]
I tell you I would turn that beep off really fast.

[Transcription stops as the user begins setting up for Phase Three.]
The user was unable to complete Phase Three of the Exercises because the experimenter had set the timings such that they were extremely short for testing purposes. Thus, all of the events occurred within about 10 seconds! The experimenter attempted to recover from this failure, but was unable to do so within the user's time constraints.

D.9.3 Debriefing

Pilot 2 was not debriefed on tape.

D.10 P3

D.10.1 Tutorial

Time	Transcript	ID
	[Introduction5: "hoarding"] Uh. Hoarding. Um… OK, so user specifies and prioritizes tasks– not files– that he or she plans to work on during an upcoming disconnection. Now that's interesting. Um… I wonder what the mapping from tasks to files is like.	
	[Introduction9: Introduce Dashboard Indicator Lights.] …dashboard indicator lights of an automobile… Well, maybe that's a reasonably successful interface… [reads screen out loud]. OK, familiarity – I'd buy that.	
	[First impression of CodaConsole indicators.] Up, there it is… Um… This window contains our version of indicator lights. There are nine different indicators. OK… I guess indicators equals text here. The names of the indicators are: Control Panel, Tokens, right, right, right, right, right. Ok, they're all there. Uh, we've purposely made the indicator window as small as possible so users will be willing to participate. Right, well thank God you haven't used little bizarre pictures whose mapping I'd have to figure out. Um…	
	[User cannot figure out where to double-click.] **Please double-click on the "Control Panel" indicator <u>light</u>.** Oh, that thing. OK… **I will add the word "light".** Right. **Would that help?**	292
	Right. I also thought it was a label, not a button so I was a little confused. I thought it was just a passive indicator of state, not an active thing that I could click on. **OK.** OK. Now I see what we're talking about.	159
	[UrgencyColors2] Interesting choice… So I'm getting all the color names twice. Once as illustration; and once to actually let me choose it. I wonder why they're not the same list. [*We added the "For the record…" comment to address this confusion.*] : My current choices are hideous. Let me put it back.	
	[EventConfiguration1] Boy, I wish this thing told me, were actually in the colors of Normal, Warning, and Critical so I don't have to remember that that's what this association is.	160
	: This is yes-or-no. Boy, that would be better as a check box. So would that…	161
	: This is the only one for which I have a choice. I'd rather have that as a radiobox.	161

[Event Tab] 162
Let's see. Something strikes me funny about the layout too, because… These events are relative to this indicator and these configurations are relative to this event, but nothing about the layout shows me that. I'd almost rather have like nesting, where the configurations were nested inside the event stuff and the event stuff was nested inside the indicator. Although this part of the screen never changes, so that's kind of a little bit. Humm… Um…

[Control Panel]
These are indicator lights over here. So this is supposed to notify me when things are 163
happening with respect to Tokens, respect to Space, respect to Network, whatever. Except Control Panel seems to be different. Control Panel seems to be there merely to pop-up this. It doesn't seem to be an indicator– maybe it's an indicator light for something, but… [chuckle] It's an indicator that I need to interact with the Control Panel [chuckle].

[Event Configuration meanings] 164
Boy, you know I really wish. See, I had to puzzle out to figure out that… that this would mean, so if this event happened I had to puzzle through all this text to figure out that that would mean flashing red. If, in fact, I've gotten it right. Boy, I'd sure appreciate a little sample here that showed me something flashing red so I wouldn't have to fig– puzzle that out.

[Space indicator flashes to indicate RVM problem]
If you open the space indicator window, uh… You'll notice that the RVM space is critically full. Opp… There it is. It's flashing. OK. If you click on the hel… OK.
So. If you open the space indicator window– I guess that's double-clicking again 46
[double-clicks]. There it is. OK. It [the Space indicator light] stopped flashing. 33
Uhm… That stopped flashing. There's nothing about this that's flashing. [chuckle] The impression I'm left with is that, by opening this window, somehow the danger has just gone away. [chuckle]

[Space Help Window]
Oh… So, the help button isn't just relative to the Control Panel. It's actually smart enough to know what's going on as well. That's pretty cool.
:
I see… OK. So, this part of the help seems like it probably always says the same thing, but the stuff below the line is relative to what's going on right now. OK. That's pretty cool.

[Network Light changes color]
It's a little strange having things happen, like, well, maybe not, I mean that's that's what this user interface is like. Things happen behind your back and so this thing changes all the time anyway so I guess having the tutorial change it is not so weird.

[Advice1]
"The job of defining these tasks is sufficiently difficult that the system needs to provide as much help as possible to the user." Difficult, difficult to do something I'm supposed to do all the time doesn't sound good. "Furthermore, the job of adapting to changes in network bandwidth of three or more orders of magnitude is sufficiently difficult that the system occasionally needs advice from the user." OK, I hope it's only occasionally. [Reads more of tutorial.] "Rather than automatically performing a fetch that will take a substantial amount of time…" I wonder who defines what substantial 245
is…

[Advice3]
"Since a process is waiting for this file request, it is important, ah, important that the request for advice receive immediate attention from the user." Mmm… So because some program wants it, I'm supposed to… Hmm… This seems like I'm the slave of

some program rather than the program being some slave of me, but presumably this is some program that I am currently using and so I care about whether it completes what it does or not.

[Configure an Event: Commit]
Huh… I wonder if I close without committing whether it'll tell me. Nope. Apparently that was abort. Or maybe it wasn't. Let me check what it says now… Um… Let's go back to advice. Weakly-connected cache miss. Nope, it's not a pop-up so apparently that was a cancel.

[Pop-Up Weak Miss] 201
Of course, the thing about this window is even though it popped-up, it's not especially attention getting– it looks just like all the other windows on the screen. So, if I weren't actively looking on my screen at the time that it popped up– 'cause I was on the phone maybe or talking to a colleague, I'd bet I wouldn't notice that.

[Begin Hoard Walk– Click on "Walk Now"] 258
And now it's yellow. Why is it yellow? Yellow means it's busy in this case maybe? I don't understand what yellow means here. And why is network yellow? Maybe that was the last exercise.
:
Now it's flashing red. Oh, boy.

[HoardWalk5]
I see… So, a task is sort of like a directory, but rather than having everything nested inside of it, presumably a task can consist of files and directories from all over the file system. Oh, like maybe the executable I'm using, like a compiler, plus the files I'm compiling. Ok, maybe that makes sense.

[Exploring Hoard Walk Advice Request]
Huh… That's interesting so I wonder if, instead of having it in my mind, that for sure I want to do activity X right now, I wonder how easy it would be to answer the question: Uh… What set of activities could I choose that would minimize the files that have to be brought over. I'm willing to do anything right now, but I can't afford to bring many files over so bring me over a few files that will let me do as much as possible. Maybe that's a weird thing to ask. I don't know.

[Hoard Walk indicator turns yellow as it performs Hoard Walk] 258
See. I'm totally baffled by what yellow means. I mean, yellow means busy, as far as I can tell. Not warning. 'Cause it isn't dangerous that it's, that it's fetching the files that I asked it to. It's good that it did it.

[Task3]
Ah..hmm… Subtasks, programs, user data. That's interesting. I wonder why the system cares about the distinction between programs and user data. Why isn't it just bits to it? Maybe the thought is that I care about the distinction somehow. I don't know. I'll keep reading.
:
Oh, I see. So I write. I see, so there's some specialization going on here. So writing might be just, maybe, my editor, but writing thesis might be writing, which contains my editor, plus the files that consist of my thesis or something. That seems pretty handy. Oh, and I'll bet you get a kind of multiple inheritance here because maybe I have writing plus latex or something. Huh! Cool. OK.

[Meta-Information] 57
"…he knows that this is a deep tree and that hoarding all of it could be a problem." Huh. It's kind of too bad that he had to know that rather than being told like how many bytes are contained, in the uh, for each of the choices or something.

1:12:00	Huh, I just thought of something. If I'm busily, oh, oh, oh, if I'm busily hacking my thesis or some code and I'm adding new source files all the time and I want to hoard them… OK, so, the thing I would do is name a directory here and pick immediate children. Right. So there's no, sort of like, problem where I have to constantly maintain this thing to add new source files in this dialog as I add them in my editor. 'Cause I can select a directory here plus its children. So. Good.	
	[Task13]	{61}
	Oh, maybe that's why you want to know the difference between programs and user data is because you're going to check the executable bit for me or something on these program definitions, whereas user data you don't care whether the thing is executable.	
	:	
1:17:00	Oh, and the other thing is, here you know I just want a file so you don't have to ask me all those meta questions. Right. OK– this makes sense.	
	[Task14]	246
1:17:36	Really?! I don't know that I believe that. What if this were a shell script. Are you going to grep the shell script looking for the things it touches. I'm not sure I believe this claim.	
	[Click "Save As"]	
1:19:15	Again, I click "Save As" and it gave me a new thingy here. I don't think I was supposed to get a new thingy. Now, I get the right thing. A program set named Scribe Tools is already defined… Hmm…	37
	[User has clicked "Save As" twice in a row.]	59
	[Task24]	
1:25:00	The "Tasks" area contains… Uh. OK. The tasks… Hmm. The "Tasks" area contains a list of all existing tasks. What was this other box**?** [double-clicks on Hoard Walk indicator] Was it Hoard Walk? There's some box that, that I was just working with that did something remarkably like this. It had the hierarchical kind of thing. Oh, well.	31
	[Task24: Bizarre form of drag and drop.]	
	I see. OK. You're right. This is totally bizarre drag-n-drop. OK.	
	:	
	OK. Well. It's weird, but it works.	
	[Task25: Prioritize]	
	So, toward the top apparently means... Well… a smaller priority number. I don't know if that means higher or… oh, you just told me. The item numbered 1 will have the highest priority. OK. So lowest number equals highest priority.	82
	:	
	I see. The priority here is really top to bottom. The numbering is sort of irrelevant. And, if I want to rechange the priorities, I have to change their order in this list.	
	:	
	I wonder what the priority of the tasks up here [all tasks list] that don't appear down here [hoarded task list] are. I guess maybe they have, like, <u>no</u> priority because they won't be hoarded or something.	242
	[Token Expiry]	
	Okay, my tokens expired, which is what that beeping was. Now it's yellow. Wait. If it was important enough to beep. Oh wait! All of this is sort of my fault. I could go into the Contr– Control Panel and, and, and change the color if I wanted. So I guess, yellow plus beeping was my choice. Other than red plus beeping seems like a smarter choice, but…	276

D.10.2 Exercises

Time	Transcript	ID
	[Please describe weakly connected and disconnected cache miss events and their configurations.]	
	Umm… Weakly connected cache miss… That's not here…[Hoard Walk indicator] So… Uh, maybe Network [indicator]. Um, well that has operating weakly connected, so that's no good. Um, maybe Space…since it has to do with caches. Nope. Not there either. Where is it? Uh, how about Network? Oh I already tried here. Um, Reintegration, Repair, and Task. Well, to heck with that, I'm just going to try one at a time then. Um, there we go. Weakly connected cache miss. I don't know why this is under Advice, but it is.	17
	[What is our connectivity to each of the servers?]	
	Oh, let's see. Um, well, they're all green so I'll type down that they are all green so I guess we're strongly connected to each of them.	
	[Which, if any, are available?]	268
	Uh, well let's see… Editing is definitely available 'cause it's there and it's green. I don't know if we're supposed to count SOSP or not. It's there, but it's red. Oh, well, I'll put that SOSP16 is there…but barely.	219
	[Please examine hoard walk advice request. Decide what objects should be fetched at this time and describe your reasoning below.]	
	So, let me look at hoard walk, by double-clicking on it. There it is. Um. So what am I doing again… Hoarded two tasks… Um… Am I in the right place? Let's see. What did this say? We've selected two tasks to be hoarded but you've recently made a connection. Just a minute ago you requested that a hoard walk be performed. OK. Now you notice that the hoard daemon has requested advice. Uh… Hum. Maybe I want advice instead [double-clicks advice indicator]. No, there's nothing here in advice. Oops. Um, which make sense cause it wasn't blinking or anything. Um… Um… Just a minute ago, you requested…right. Now you notice that the hoard daemon has requested advice. Please examine the request. Decide what objects should be fetched this time at this time. Describe your reasoning below. Hm… [Double-clicks on task indicator] So, I clicked on. I'm basically confused… So I'm trying to puzzle my way out of this. Umm. I'm confused because… Well, let's see. This mentions… Let's see. This mentions the hoard walk being involved so I brought up– oh, rats, I hate this window manager– I brought up, rrr, it's window, but I don't see anything sort of relevant. Um… It seems to be requesting, I've been told it's requesting advice, but the advice panel doesn't have anything. Doesn't say anything about advice here. There's no, like, nothing in the "Advice Needed" window. Um.. Hoard Walk Information. I don't see anything really relevant there. Um… [click on help.] I just asked for help in the hoard walk information box. Hoard Walk Advice Window– oh, OK– allows you to give advice to the hoard daemon about what tasks should be fetched. The upper left corner contains information about the status of the cache. Right. The upper right corner contains information about the network status. OK. I remember that. Um. Information about the number of objects to be fetched during this hoard walk and the amount of time those fetches are expected to take. Humm… OK. The main body of this window shows tasks for which one or more objects need to be fetched. These tasks are shown hierarchically. OK. Well, what did the tutorial thingy say again? It said you have selected two tasks to be hoarded. You recently made a connection. Please examine the request. Decide what objects should be fetched. Describe your reasoning below. Hmm. HmHmHmmm. So I don't think I want the task information 'cause that's just for saying what files are associated with	155

what tasks so I don't care about that right now. Um… Let's see… Maybe I'm supposed to start the hoard walk. Let's see what saying fetch does. [Clicks on "Fetch" button in Hoard Walk Information window.] So, let's see. Well….
Experimenter stopped this exercise because once the "Fetch" button has been clicked, it is impossible to complete the exercise. 236

[Please define a task for writing your CV.]
Well, since I don't know how, it's my advisor's directory, I don't know how big it is so I'll do the conservative thing and pick immediate children. I still think it'd be nice if immediate children vs. all descendants gave me, like parenthetically, how much data that was off to the side. 57

[User hoards newly defined task. Task indicator blinks and turns red.]
OK, well, now it's beeping at me. Um… I wonder why it is beeping at me. Um… OK. I double-click on it and it's giving me its task definition, which doesn't tell me anything about why. Um… Oh, maybe I'm running out of… maybe the problem is I've over-committed myself in terms of cache space and that's why it's beeping. Huh. Oh, well. I'm going to ignore that for now. 261

[Please define task for reading paper.] 157
This seems like an awful lot of trouble just to get one file onto my machine.

[Hoards reading paper task.]
So I'll put reading paper in here. And, it too is red so… Chances are, the red in fact it's… Oh, I see what these little indicators are. OK. No, I guess I don't see what these indicators are. Um… Let me resize the window. Huh, so these 3 say 37– oh, these first 4 say 37 Meg. This last one says 34 Meg. Hoarded Tasks. Oh here's the cache space up here. That says 97 Meg. Huh. OK, I now have no clue what these little picture over here mean. Maybe I was shown in the tutorial and I've now forgotten. Um. And I certainly don't know why these are red. 269 268

[Hoards thesis task.] 268
Huh, it's red like the others are. So there's definitely something going on here, but I don't know what it is.

For Phase Three, we switch to a different screen format and a different method of interaction. The transition to this segment of the Exercises confused the user. The user's comments helped us improve this transition such that none of the six actual users expressed confusion over what was happening. 167
[Dialog between the user and the experimenter related to this confusion is omitted.]

[User fills out incident report after we fix the RVM problem.]
Oh, but wait…. Oh, I see, I see, I see, OK. So now the network's doing something goofy… So I wasn't supposed to fill out an incident report for that last thing.

[Incident Report button does not work while weak miss and discomiss query is visible.] 168
We fixed this problem for the final version.

[Reintegration Pending Event.] 239
Well, it's red, so I'll figure it's critical.

D.10.3 Debriefing

Pilot 3 was not debriefed on tape.

D.11 P4

D.11.1 Tutorial

Time	Transcript	ID
5:10	[Introduction7] Okay, that's a problem on a one-directional link, but not that much of a problem on a two-directional link.	
6:05	[Introduction9] That's good. Metaphors are good.	
6:35	**Can I ask you to be a little bit more [?] thinking aloud?** Oh. Ok. **Thanks.**	
6:50	[Introduction9] The metaphor may only go so far…[reading]…or like the battery indicator on a laptop	
7:45	[Introduction10] Hoard Walk?	231
8:05	[Introduction10] Though putting the Control Panel [indicator lights] on the side assumes that you're more interested in vertical space than horizontal, which isn't necessarily true, especially when I use the system, but that's okay. (eh?), live with it.	169
8:30	[Introduction10] Would it change to yellow on black, or would it change to black on a yellow background?	170
10:15	[UrgencyColors2] …The default yellow is a lot brighter than green… so it's easy to see. Hmm… But to be honest I would like, I would like it if…critical were black letters on a red background.	171
	[UrgencyColors2: User agrees with the "For the record" comment.]	
12:25	So I was thinking warning might be nice if it was a little brighter. And…I'd really love to change the background color as well as the foreground color. Oh…Red is too dark, but orange is pretty good. Dark orange is brighter, which is good, but it's also less red, which isn't so good. Orange is worse still. I guess we'll do OrangeRed.	265 171 266
13:50	[Network1] Weak?	229
14:20	[Network1 – percent of maximum Ethernet bandwidth] Okay, that's interesting, except that bandwidth isn't used linearly on Ethernet so, this might be good, 17% on rossini might be good, but it might also be, kind of, marginal, and I just have to trust that the designers have selected thresholds that are reasonable, which is actually a problem if I upgrade to a 100 Mb, for instance, on part of it, possibly, ok, for instance.	172

15:25	[Network2] Ah. Ok. So now network is flashing. That's a good way to get attention. Very good.	
16:00	[Task1] I'm tempted to wonder why these [indicator lights] are not alphabetized? It means, when I, if I'm unfamiliar with it, and it says the Task window, I have to do a linear search through all of them to find it. That's a little slow.	143
17:15	[Task1] Where program in this sense means more than just the binary.	
20:30	Can I see multiple ones at once if I move this sucker over here? Yes, I can see multiples ones at once. OK. That's nice.	~24
21:30	[Explores the task definitions.] I'm thinking that "writing" might contain configuration setup for the programs here, but that hopefully is defined in the appropriate programs. So, for instance, editing would use the program emacs which would contain the user data .emacs in my home directory. [Explores the task definitions some more.]	173
23:35	[Task6: In Data Definition segment…] How do I get more of this? It would be nice if there was some easy way to see more of the text of the thing.	21
24:05	And since dissertation is a subdirectory of thesis, presumably you don't just suck in the whole subordinate tree, but you have to specify the leaves. OK… Meta-information. None… children or all descendants… OK. That makes some sense. That's not too bad.	
26:30	[Task7] "…he know is shallow tree…". Not so much shallow in terms of how many. Hmm… So shallow in this sense means not very much data, not, not very deep. 'cause it could be deep, but have not a lot of stuff in it.	{57}
28:05	[Task10] [Types in name of data set into pathname area.]	137
28:25	[Realizes mistake.]	
28:55	[Task11] I can see how typing /coda/usr/bovik would be really tedious in this, like tilde [~] would be a nice thing…	94
29:20	[Task11] Ok, and I've typed this, and it's not letting me select any of "None" or whatever, so this is slightly confusing.	
29:35	**So the, when you type a path here…** When I type a path here… **it actually checks to see** Right **if that's a directory.** OK, so this is, this is a–. **That directory doesn't exist** So, right. Right so some poor port of this doesn't exist, which is why I'm not allowed to do, do that. Hmm… **Exactly, so one of the things you could do–** Is make it up. There's an idea. Ok. It would be nice if there was more feedback here that… **this is not a directory** Yeah, that–	36

	OK like, some box that says doesn't exist or something.	
32:3?	[User hits "Save As" twice.]	37 184
33:00	Ah. In the data definition window and in file dialogs like that, on a MacIntosh these days, it's fairly common to find a "Make New Folder" for it, so in this case, "Make New Directory" button and that might be helpful here so that I don't– didn't have to bring up an, an xterm and just make the stuff by hand.	175
34:30	[Task14] Ok, how does it track?	246
36:00	[User hits "Save As"; interface inserts an empty entry widget; user re-clicks "Save As"; interface brings up "already exists" dialog; user mildly confused.]	37 184
37:45	[Task18] Hmm… Okay, "…and hit <Return>." I typed <Return>, and the only evidence that I have that it did anything at all is I might have heard the disk chatter. Hmm… Interesting. *User encountered an interface bug. The experimenter got the interface and the user back on track, so that the experiment could continue.*	
	[User discovers that <Backspace> doesn't work on `telos`.]	176
40:55	["Save As" dialog after the first "Save As" – this is an artifact of the way the experimenter worked around the interface bug, but since the user encountered this dialog box naturally at 32:3? above, the comments are included here.] "'Writing with Scribe' is already defined." Okay. That's confusing. Perhaps I wanted to click "Save" rather than "Save As". How 'bout that? Yeah. Okay.	184
	It has squawked at me about… [reads last paragraph of Task20]	
42:40	[Task21] And I guess there is no sense that it could be possibly be yellow – either it's there or it's not there. Okay.	
43:??	[Task21] Maybe it should be "1: writing thesis"? Stylistic.	177
43:??	[Task21] Oh, I can't just reorder the list?	64
47:00	[Advice3] It could also start servicing the, the re–, the request as it's asking you whether or not you want to do it, though that might interfere with other things you're doing, especially if you're trying to interactively use, say, a low bandwidth link – like say, a modem.	178
48:20	[Advice4 – weak miss time out series.] Neat. That was, that was pretty, uh, good.	
52:22	[Hoard Walk Advice Window.] "All Tasks Needing Data" – Not very informative.	71
52:48	[HoardWalk4] So is that like, "Fetch Now" "Don't Fetch Now"?	232
53:20	[HoardWalk4] It's becoming more common to have the, sort of, indicators that point ▼ or ▶ . [Note: User indicated the arrows with gestures.]	142

54:25	[HoardWalk5] It's interesting that you have to select it and then hit the button. Editing… and… Right. And then you have to select it and then double-click. So it's really three clicks.	179
55:00	[User hits "Fetch?" button] "Then click on the 'Fetch' button. Notice that a hoard walk– Indicator turns yellow." Mmm… Red actually. [Looks back and forth for about 20 seconds.] Okay. Let's see. Hoard Walk Information is Hoard Walk Advice. Or should I do that step again? **What step do you think you are on? [mumbles]** Let's see. Um. So I requested that all tasks be fetched. Then click on the "Fetch" button and it didn't seem to do anything, though this updated when I selected that. Oh! Aha! There's this and then there's that. **Right. I'll try to make that clearer.** Perhaps if you say the "Fetch" button in the lower right-hand corner. [Hits "Fetch?" button and believes fetch to have started when, in fact, this just selects the object for fetch, and the hoard walk won't actually continue until the user clicks on the "Fetch" button in the lower right corner.]	237 283
	[Space Help window – "Be careful not to hoard more data than will fit in your cache."] I wonder what happens if you do?	 247
59:25	I suppose that's a good dialog. I only think it trite since I'm reading the tutorial.	180
59:45	[Tokens] I wonder when Tokens turn yellow, like how many hours.	248
1:02:45	OK. So, read disconnected, so I've got my, say, laptop. I am, say, not connected to any network and I go try to read something that's not there. And, it's configuration is to silently… now I don't know… presumably that, that does not mean silently fail, that presumably means silently hang… pending, pending network. Though I don't know. : [Reads description of "Operating Disconnected" event configuration. Looks at configuration of "Read Disconnected Cache Miss". User is somewhat confused.] :	38 124
1:03:50	Is that true? I have notify "No." So it always notifies by flashing. That's not clear. : [Fixes configuration of the "Read Disconnected Cache Miss Advice" event to be consistent with the description of the "Operating Disconnected" event provided in the Tutorial.]	38

D.11.2 Exercises

Time	Transcript	ID
	The numbers are good 'cause the bars are all about the same for the 15 and 17%.	
3:25	[Exercise #3] Task is red… So I pulled up information.. and what I see is… In the hoarded task… I see the cache space is OK… the task list… the list of tasks I mean… they're not… I haven't hoarded any of them yet. In the hoarded tasks, um, SOSP16 is only got 15% of it in the cache. (2) Recommendation letters has 2%, all of nothing in the cache… and (3) Darpa Grants has 64% in the cache. But editing is fine.	
	[Exercise #4] [Immediately pulls up Control Panel. Immediately chooses task indicator.]	

Unfetch Help… Editing… Unselecting… duplicated in another task… unselecting this element will mean it is not fetched for other… But I need editing to do both of these things. OK. So this is a slightly confusing … message because editing, which is, which I know to be a task, has ca– popped up even though it is not explicitly listed under task names. Do I want to unselect editing from all these tasks? No, I don't want to unselect. It's a double negative. It's a little odd, but there it is… OK. 140

The current space status is OK. I don't even need to pull up the box for, but I did since I'm predicting from the dialog that I need to answer more questions.
:
These are good dialogs. They're clear. Well, they're almost clear. This 66 is overlapping a little to the left, so stylistically it could be off on that side. Um… But these are pretty good. 77

17:30 So I want the events. Um… So I want the configuration of the events so I'm pulling up the Control Panel. Event configuration for... Let's see… The cache misses should be under space, I hope. No. No, that's just running out of space. OK. So I look under Network, and I only see operating strongly, weakly or disconnected. Ah… Advice. OK. Hmm… It's slightly odd to me that the we-, the we-, the cache misses would be under Advice rather than Space or Network since I consider the cache to be part of Space. Fine. 17

21:20 Actually, I'm not sure, thinking about it, I'm not sure. I'm not sure if the weakly connected means my link or the current server link. 233

22:30 …First, I'm going to try to disambiguate read disconnected from a weakly connected. 80

22:55 Further investigation shows that "weak" refers to my link. 233

23:00 OK. Disconnected cache miss. Now, not clear, it's not clear to me… what's the difference is between a disconnected and a read disconnected, though I believe this is a write disconnected. What I tried to update. Not… I imagine… since this is… different from a read disconnected miss that this refers to a.. an update, update to, to, to change data on a server and… [inaudible, but his typewritten answer would complete this sentence with "cannot reach it (or anything else)".] 80

29:20 I'm going to look in my...xterm here to see whether I can pick just immediate children or all descendants of /coda/usr/bovik/src/venus… So I'm changing directory to /coda/usr/bovik/src and I'm going to look in venus. And, not see any directories. I'll look under advice. OK. And I'm going to look in console. OK. These all appear to be, ah… OK. Console uses tcl. Hmm… [clears throat] Make a note to myself that console uses tcl, which means that I'm going to need to pick up tcl. So, good, fine. Ah… Well, it's safe to do all descendants on this. Good. {57} {185}

I'm not quite sure… what… that underline means. It's just sorta, there. I'm not sure if that means anything in particular or not. 181

Hmm… I wonder why CodaHacking is unde… before New… I guess it's an alphabetizing thing. It would be convenient for New… to be at the top. So I'm going to turn that to lower case… and save it again. Good. Oh. How interesting. Fine. Go away. You, yo, alright, well. I tried to delete this and it didn't seem to do anything. Ah. Delete task. Aha. That makes some sense. OK. And now I'm conveniently at New… task so that's good. 7 138

And that's going to require CodaHacking. Oops! Just once, thanks. 22

The bugs are compressed. So… I'm going to need ga-zip or something. But I'll do that in a moment. {185}

[Experimenter explains @sys (i386_mach vs. i486_nbsd1) issue.]

Pretend any binary is in /coda/misc/bin.

	Well, I'm just going to bring up… the CodaBugFixing task definition 'cause it's the most convenient way to get to the user data definition… this is so that I can make a new one of them.	183
	Oh… I hit <Tab> and it doesn't send me to the bar so I'm wondering what I've… ha ha… I have made a typo.	36
	So, I've defined user data that's "useful headers" and now I'm defining a task that's "looking at headers," that contains the "useful headers" as data and gnu-emacs as a program and I don't need any subtasks. This will let me put the "looking at headers" task in the hoarding area, but at a different priority than "CodaBugFixing." OK.	
	[Save As on Scribe twice] Set named Scribe. Oh… So I didn't have to do one. Well, good. So there already was a Scribe. Oh really? ... Well, I'll just look at it. And it's just fine. But there isn't a gv. [Defines gv] OK. Boy. I just hit them. So I move this over here and I'm going to look… ah… there's it. Good. Alright. Fine. [Finds 2 gv's now?]	184
	[Removes "gnu-emacs" program from all task definitions and adds "editing" subtask instead. Likes it better this way because it's more abstract.]	
	Fine. It started yelling at me about how it doesn't have everything to "write cv", which is not surprising.	
	Ah… Tasks was flashing because it was turning green. Good. So the previous stuff should be all set.	{9}
	Poof! And a magic fairy turns RVM to okay.	
	I seem to actually be using occasional cognitive cycles, glancing over at the network display, er, the, ah, the, ah, summary panel actually to make sure that everything is still ducky. Tetris is a good test of this because it tends to require actually a lot of thought. So… Huh! What a score! … Oops, missed a block.	41
	Now I'm not sure I can decide whether tokens expiring is a warning problem or a critical problem, though frankly, I would classify this as critical since, if I don't type in tokens I don't… I'm not able to do anything more.	257

D.11.3 Debriefing

Time	Transcript	ID
	["The interface helped deal with the actual complexity"] Right. So, suppose I didn't have this interface and I was trying to set up to hoard. Um. You know. I've still got this problem of I have a bunch of data that I want to work with, a bunch of programs that I want to work with and I need some way of specifying, well, shove all these things in the cache. You know, go get them now. And I can easily see that without, without some decent tool to help package them up that could be, um, become a mighty big pain. Um. I actually foresee– so for common ones just writing little shell scripts that did essentially the same thing as this, but this is a nice, general, easy-to-use interface. I really. I thought that was actually one of the, one of the best, the best sort of, interesting parts of the, hard parts of the interface is to be able ta–, to abstract away from individual programs and data to tasks and tasks that use general pieces of data as their thing.	
	[Concerned about tracking references – discussion.]	

	One of the problems with the abstraction of tasks is that, you know, if you buy into it and it looks like a really good idea to me, you know, to do that and you want to set up a nice abstract set of classes. Then that's a great except… there's still things you have to discover for anything, like, oh, I want to work on fixing Coda Bugs during the snow storm. Oh, I've gone and compressed all of my bug files so now I have to go…	185
	[Likes gauges and lights: lights to get attention and gauge to see more detail. : Tri-state: OK– warning– error better than good/bad.]	186
	[Discuss needs of Speech Recognition systems.]	
	The ability to specify pop-up dialogs for most any situation arbitrarily is great. Um… [having the system able to pop-up and user able to configure it to pop-up or not] 'cause pop-ups are annoying and I want to be annoyed in some situations and I want to be left alone in others.	
	The point of that is that the situation changes, sometimes. So, it's not like you can figure out should this pop-up or not once and for all and get it right. Um. So the flip side of that is that, I think what I'm suggesting for an expansion of it is to sorta have working sets of settings. Um, so that you can have these macro descriptions of "I'm disconnected," or "I'm at CMU," or that sort of thing. So where when you think you're plugged in and it loses the network you'd like to know about it right away. But if you're disconnected, you know, who cares and selecting amongst those would change a whole lot of individual configuration settings. : [Seen something like that for Power Macs for "plugged in" vs. "on battery".]	187
	[User offers a hypothesis as to why users hit "Save As" twice. Users may expect "Save As" to bring up a dialog asking for a new name.]	188
	[Discuss why user didn't fill out form when state changed from bad to good.]	

D.12 P5

D.12.1 Tutorial

Time	Transcript	ID
	Well, I clicked "Commit" and nothing happened. I'll click "Commit" again. OK. So that's kinda funny. Ah. Oh. OK. So have to close it separately from committing.	32
	(There should) be something so all the windows didn't come on top of each other and obscure the earlier ones.	1
	If I keep going like this, I'm going to have too many windows to handle.	24

	Whoa! Why won't it let me click "all descendants"? That's really funny… Oh, I guess I have to hit <Enter> and now I can click "all descendants".	20 3
	So, for executables, it would be nice if could follow the path. I wonder if it does that– 'cause I don't remember where these programs are.	94
	[close all windows] Close. Oh I forgot to click the "Save" button. Can I pull that window up again. Task Definition. Task Definition. I guess I lost it. OK. So, I need to… OK. Duh! Oh well. That's Okay. : [Redefining a new task definition.] Click the "Save" button– don't forget to do that this time.	127
	Click on the "Scribe Tools" in the program predefined list. I did that. OK. Well, it di–, it didn't put "Scribe tools" in here. Oh. OK. So, it underlined it in some ways. So, hit the save button– Oh! I double-clicked. I should have clicked. This double-click/ click thing is such a pain. OK. "Scribe Tools". Excellent.	23
	So it doesn't tell me how much is unavailable. Does it? Oh. OK. 90% is unavailable. [Actually, the meter is indicating that 90% is available.] I guess. That's sort of confusing.	268
	I guess it was green before.. so that means that a hoard walk isn't happening I suppose. OK. Let's… let's close this. And I suppose it'll do it in the background, except that it's doing this funny flashing thing now. Which I'm not quite sure what this means. Now they both went red. OK. When weakly connected to the servers [mumbling] may request advice. By default the Hoard Walk indicator changes from yellow to red. Hmm. I guess now the different colors just mean too many different things. Maybe it should pop-up windows instead.	9 262
	Please select the "Read Disconnected Cache Miss"… under the Advice… And, read disconnected, oh I guess that's "Write Disconnected Cache Miss". Oops!	80

D.12.2 Exercises

Time	Transcript	ID
	"What is our connectivity to each of the servers? Strongly connected, weakly connected, or disconnected?" :	
	OK. Let's pretend we're weakly connected. And, uh, I don't know, and scarlatti 'cause that always sucks. :	274
	"Please describe the "One or More Unavailable Ta–" event. Does the interface… notify… what urgency level? Oh, oh, OK. Oh. Whoops! I thought I was supposed to make stuff up. Oops! OK, so I clearly. OK so, let's, let's, ah. [Sighs.] One or more tasks unavailable. So where would that be? That would be under… task… [User double-clicks on Tasks indicator, looks around, then double-clicks on Control Panel.] :	147
	Right. OK. Tokens, Network, Advice, Reintegration, Repair. Wait. So where did this? Space maybe. Network, Advice, Reintegration, Repair. Task. Ah. There it is.	17
	Lower numbers is higher priority, right? I think that's what it means. Let's click on help and make sure… That's right.	82

OK. It doesn't seem to be doing anything…yet. I suppose I have to… I don't see the hoard daemon asking me for advice. Maybe I should ask for a hoard walk, so let's go click on hoard walk. OK. Selected two tasks. Is that right? Well, it looks like we're at three tasks, with Darpa Grant. So, fetch, no, fetch, fetch, OK… Hmm… That's really strange. The tutorial seems to say that the hoard walk was started automatically. But, ah, wel– whatever… Well, it walked the whole hoard. …. OK. 155 235

[Searches through indicators for the "Weakly Connected Cache Miss Advice" event.] So maybe there should be a description of each indicator since there're so many of them. 17

Whoa! I keep flipping yes and no. Damn! Alright so I'm… I need to get yes and no straight in my head. {161} {70}

Wait. Where's my "Building Coda"? Don't see it. Oops. OK. [searching] Event configuration. Whatever, whatever. Pair. OK. So this is not it. How the hell do I make a new task? Tokens, Space, Network, Advice, Hoard Walk… Oh, OK, here we go. And, oh, "Building Coda" is a program. So, how do I get a list of all the programs task I've defined without going through, like, something that uses one of them? That's very weird. 18 183

Oh! Whoa! Why won't it let me click on all descendants? Oh! Come on! Hmm! That's interesting. That's really weird. So. Won't let me do that. Hmm. Ah OK. I typed C-I-D-A that makes sense. Oh. It still won't let me do that. That's kinda weird. That is weird. Oh well. We'll just assume it let me did that. OK. 20 36

Hmm. It would be nice if it, like, beeped or something to tell me a directory didn't exist. 36

OK. So I'll make a low priority task called "Coda includes" or "Coda unimportant includes".

Where's Scribe? Ah, in, aw… don't have Scribe, uh? Well. Eee, no don't click on that, don't click on that, don't… Double-click, huh! Well my Scribe tools just went away . [Thought this was defined from before during the tutorial?] {23}

Don't forget to think out loud.

[Hoarding stuff] 127
And, then, ok, it looks like I did didn't save, oh man! I didn't save that "Coda bug fix" task. Oh! What a pain! OK. So let's go make that again. Ah… Oh, bummer! OK. So. It needs to prevent me, from ah, from closing a window if I don't save something because I just do that <u>way</u> too often. And, now, my right, my "coda bug fix" task has just disappeared. Oops!

Please remember to fill out incident reports even when things turn from bad to good.
Oh, OK. So one like one for when the RVM thing went away.
Yeah.
OK

[TaskUnavailable event causes system to beep three times.] 29
Task. Oh, it beeped. Right. What happened? Right. So, what's wrong? So, it couldn't get anything on the CV. It beeped. Not exactly sure what it wants. Cache space is fine. Hoarded tasks– red. So why did the CV thing go red? I guess that's critical.
:
I don't quite understand this. Why would it go red? Well, let's look at space. Space is fine. What about hoard walk? Well, what if I tell it to walk? Okay. Okay, so it's doing something funny with the hoard walk. So why does it need the CV fer– huh? OK. So, so, I'm disconnected [User is not disconnected!] so that's why it's doing

funny things with the hoard walk, but why did the task thing go red? Because, it couldn't get some file? Don't know. That's really strange… Okay, so it went green. OK. And it filled up my CV thing. So this.. I… don't quite get this because I was compiling my thesis I thought.

OK. So, what happened to the network now. Oh, I need to do an incident report. So I've become weakly connected.

[TokenExpiry event causes system to beep three times.]
OK. What happened? I ran out of tokens. Did I? Oh no… So, submit. No password provided. Whoops! OK. So this is critical, because I need all this stuff.

Oh, I'm disconnected! No, (I'm not) disconnected anymore.

Why is it (changing) OBJS when I was doing a latex?

D.12.3 Debriefing

Time	Transcript	ID
	One thing I had trouble with was, sort of, the general instructions were all mixed up with the "do this thing now." Or seemed to be. So, if they were sort of separate and bold font or something, it might help. **OK. So, so you mean the arrow things.** Oh! Those were the, ah, OK, so I guess, right. Um. [?] Maybe it was just like, my learning how to use the whole thing because that sort of thing went away after awhile.	189
	I thought it was funny that the tutorial didn't have any of the reintegration stuff and then it popped up during the exercises. **So the reason I did that, is just to see how people would react and whether they'd be able to figure it out.** So that was intentional. **That's why it was the very last thing and that way if people got totally confused it didn't hurt anything else… The disconnected cache miss was the same way. You hadn't seen that in the tutorial either. You'd heard about it, but I hadn't actually showed you what it looked like.** Right. **That didn't bother you as much.** No, I guess, ah… So, the funny thing was you would expect for a disconnected cache miss that, like, your latex would be running somewhere and it would just stop and keel over, but that part of it wasn't in there at all…	239
	The other thing with the tasks is that, I think, programs, there should be a way to put in stuff that Coda doesn't infer as well 'cause with latex, like, if you, if, like, it if you just cache the stuff that latex used even on 10 runs, on the 11th runs it might decide it needs a new font file. I mean, 'cause this happened to me all the time. So, I mean, I should be able to say, for this program cache all the **this whole directory** or these set of font files. Something like that. **So you'd like the programs to also let you include, and I know you need this, like, so definitions kind of like the, in the data definitions only part of the program definition.**	190
	[(2e) Clarify: Little bar that shows how much of my cache I'm using up. If a hoard walk is going on, show meter on screen. Or click and have them come up without all	

	the motif stuff surrounding it.]	
	[Cars that talk to you. Something's wrong with the headlamp and then you go investigate to figure out what.]	
	[Evaluation Questionnaire: User most likes the task support.] **You like the task definitions, huh?** Yeah, that, I mean, that's the most painful part. Is constructing those hoard files so if there was some easy way to do that, that's what I'd use the most.	
	[Evaluation Questionnaire: User most dislikes number of indicator lights.] **Too many indicator lights– which ones do you think could be combined?** That's a good question… [User suggests having one indicator just that means "something is wrong".]	192
	[User suggests having the green ones not visible, to only have the indicator show up if something goes wrong.] [User expects to be able to configure which indicators are visible "in a final system."]	193
	[Discuss problem with "Yes"/"No".]	
	Does anything in the study throw you because of what you know about Coda coming in? [Confusion because no mention of spy; discuss "autospy" tool.] *Should be fine for experts.*	

D.13 S1

Participant S1 is a member of the secretarial support staff. She volunteered to participant in my usability test to better understand Coda. Her background includes some computer science undergraduate courses. Once again, since the goal of our work was to familiarize her with Coda, I tended to interact with this user somewhat more than would normally be appropriate. For example, about 28 minutes into the Tutorial as she was struggling with a known problem with the directions in Task10, I stopped her to better explain what was meant.

D.13.1 Tutorial

Time	Transcript	ID
	Hmm. **Don't forget to think out loud.** Hmm? **Don't forget to think out loud.** OK **Thanks.**	

	[User explores Task Definitions.]	
19:??	[User does not double-click on "thesis" element, as instructed, but she is able to recover on her own.]	124
25:??	[Reading <Tab> vs. <Enter> description.]	3
	And if I go back [to first path: /coda/project/coda/slides], it does not allow me to do that. Probably because that thing really isn't a directory. No. Because– Hmm. [Rereads description.] So, another pathname. How 'bout /coda/project/coda/(proven).ppt. [sigh]	36
28:??	**It is checking those pathnames to check to see if they're directories. So if they– if the directory's not– if it's not a directory, the meta-information will not be enabled. Make sense?**	
	Mm. Hmm.	
	OK.	
	Wait! If it's not a directory, meta-information won't be disabled?	
	Right. Will not be enabled.	
	Will not be enabled.	
	Right so.	
	If it's a file though, such as	
	If it is a directory, it will enable the meta-information.	
	OK.	
	OK.	
	So, this is a directory. Why can't I choose (the meta-information). [Mumbles] [sound of typing].	
	You sure it's not /coda/usr/satya?	
	It is. But I thought we were supposed to make them up.	
	Well, you can. Use actual direct- So, so, This. It's actually looking in the file system to verify that that's a directory.	
	Mmm. Ok.	
	Does that make sense? So, you can– you don't have to make up– fake– you don't have to make up fake filenames and pathname. It was just use whatever filenames– pathnames come to mind is what I meant by that…	
34:15	[User types "/coda/misc/bin/scribe and /coda/misc/bin/gv" as a program pathname.]	137
55:??	Oops. Back one. A window titled "Authentication Information" should now be visible on your screen. I skipped one.	194
	Let me read it to you.	
	OK.	
	So you have a window title. OK. Now let's explore. Let's now explore the Tokens indicator. For the purposes of this study… [Experimenter reads Tokens1 to the user.]	
	Thank you.	
	You're welcome.	
57:30	[User struggles with the first paragraph of EventConfiguration2 (selecting a different indicator).]	226 {206}

D.13.2 Exercises

Time	Transcript	ID
	Hmm. Perhaps I'm not allowed to have that open at the same time. : **Click "OK" on the Help window and things'll come back.**	13
6:??	Hmm. Critical. That's the term I'm looking for– critical. Saying critical. Nno. Well, let's see. Will it beep at the user? Ah. If we have Control Panels, then we have– well, wait. I have Task up. So, Darpa Grant. Nmm… No. That's not the information we're looking for. Or, that I am looking for. I am looking for inf-information about that task. Annn… not Space, and it's not Tokens, and in Control Panel. Hmm… How 'bout Task? Ah. "Under what conditions will the "One or More Task Unavailable" event occur?" Three, Darpa Grant– that's an example. <u>But</u>, it <u>really</u> is condition, task, um, is a multiple task and that's why the red-critical is shown. I believe.	234 147 17
	[When do Tokens expire?] April 24. At 10:25, I believe in the "am", I'll assume it would be military time…	195
9:??	[What Tasks are currently defined?] There are four. Hmm. Defined. Darpa Grant, Editing, Recommendation Letters, SOSP16, and Writing. 1 2 3 Wait 1, 2, 3, 4, 5. Which of these are hoarded? 4.	
11:??	[User does not explore beyond "All Tasks Needing Data" in Hoard Walk Advice.] So. Recommendation Letters and SOSP16. All Tasks. So really what I want them to do is to finish the hoard walk and to go ahead and <u>fetch</u> the information. So these tasks now separately are both at 100% availability. The hoard walk is in progress.	236
14:30 17:00	[Please describe Miss Events] No, I don't want Network Information such as that. Nnn. Nor. Nor this I believe. Operating Weakly Connected. Nnn. No. Operating Weakly Connected. (…urgency colors). Really, this has <u>nothing</u> to do with it. Hmm… The Advice Monitor isn't going to tell me that either. Task Definitions aren't either. So basically just describe Operating Weakly Connected. The advice. What will the Advice monitor provide. Well, weakly connected, will, will notify the user with a yellow warning, <u>not</u> critical, but will not pop-up, oop, beep, or flash. The other question is "<u>Dis</u>connected Cache Miss Advice" will notify the user with, I should really include that, cache miss advice [added to typewritten answer about the "Weakly Connected Cache Miss Advice" event], will not, so it will notify the user with a red-critical warning, but [mumble] will pop-up but will not beep or flash. [This is the correct configuration for the "Operating Disconnected" event.] *User modifies the settings for the "Operating Disconnected" and "Operating Weakly Connected" events. The experimenter then spent quite a bit of timing figuring out how to undo these modifications before the beginning of Phase Three. (We had anticipated that the user might incorrectly modify the actual events and had written the Exercises to ensure that these events were configured properly before the beginning of Phase Three. We had not, however, anticipated that the user might modify other events. In any case, the experimenter successfully fixed the damage before Phase Three began. The user apparently remained unaware of the goings on, though could have noticed a mysterious window appear and then disappear very quickly – if she did, she made no comment about it.)*	17

	["Building Coda"] Is that defined somewhere? Or is that something I need to define. Hmm. What is predefined? Not letters of recommendation. Not papers. Not proposals. Darpa 97. No. "Create a task for fixing Coda bugs." What I need to do is to contain these executables. OK, that makes sense. "Building Coda". (Well) I also need editing because it's going to be reports. So, writing. Probably gnu-emacs since it's going to be writing and debugging. Only what application or what predefined debug coda. gnu-comp/@sys/bin/gcc. That is not. Source code. Well. How do I– the sources to the code that you must modify are located– Hmm. Nope. Contains the following pathnames. No. So, I need to debug coda and these are the sources to the code. So. /coda/usr/bovik/src/venus. Hmm. And, of it, I think that I should include "all descendants" because I need all this information. I need it to pull in from there. And again /coda/usr/bovik/advice and again "all descendants."	
	I believe that's not an executable– I believe that's a file. No, that is programs, so I also need to find it. Here. Backspace. Control-U doesn't work. Oh no. Oh no. /coda/misc/gnu-comp/omega/bin/gdb. [Note: User added gdb to the gnu-emacs definition rather than the "building coda" definition.]	196
	[User looks for bug reports. It seems that user thinks the reports are formatted so user includes the "writing" task in the "bug fixing" task.]	197
33:30	[User adds header files to "bug fixing" task– in data definition with the source directories.] "So you don't want to just add them to your 'Building Coda' programs." So you don't want to add them to programs, but you could add them to user data. "Because it could be hoarded in preference to really important source files". Hmm. So why don't we just add them to… user data. Um. Perhaps we'll just add for immediate children and add them as user data.	100
38:45	[Puts a single program in each definition.]	198
39:45	[Single click adds unintended element.]	23
41:30	[Please hoard these tasks. First tries Hoard Walk indicator.] Now I need to hoard them. OK. Debug coda. Whoops. That's not what I meant to do. No I wish to bring it here. I have 66% of cache space available. Various header files. So basically writing…	
43:45	I think debugging should be first because that calls for the most resources so… walk now for the Hoard Walk. [See also: user's written comments re: reasoning] [Verifies resources requirements in Task Information. Requested walk before instructed to do so.]	199
	I can't [bring up "tetris&"]. **You can't put the, um, the ampersand doesn't work because it takes over the xterm.** OK. And I have another question for you– what is supposed to be happening, though, while I'm doing this? **I can't answer that. But now that you've started playing the game, you can click "OK".** OK.	
55:05	[User does own hoard walk to solve TaskUnavailable problem.]	

57:45	Oop! [User and Experimenter chuckle.] Sorry **Um. You killed ctwm– [laughter].** Sorry. **That's okay. It didn't– I don't think it hurt.** My hoard walk is still going. **I wish I could see that. [mumble]. Hello?! OK. All better except that things are appearing in the wrong– you're just going to have to ignore some screens–** That's on pause. **I need that. Raise window. Ignore this stuff down here.** OK. That's fine.	
1:00:40	Oh. Network. Pause. Wow! All resources are low. Requesting program: /mach/alpha/bin/latex2e. Estimated Fetch Time: 23 minutes, (?)7 seconds. So, we're weakly connected with our miss cache. Advice is critical. Weak Miss. "Weak Miss questionnaire running already. Please try again later." "There is a weak miss questionnaire running already. Please try again later." Sign… Um. No, please fetch.	200
1:01:40	"The bandwidth to each server is expressed as a percentage of the maximum Ethernet speed. Servers whose names are written in light gray have had their network connections artificially manipulated through the Control Panel. Servers whose bandwidth estimate is unknown have a bar shown in dark gray." OK (I) understand that, but I'm just weakly connected. Advice monitor is not helping me right now. I'm sort of in fetch mode right now. Hmm… And what it's indicating for weakly connected is a warning. Notify. Yes. Uh. OK. Now the network is really bad. Um. It's telling me I'm disconnected. So. [Sigh.] I need to connect to all (of 'em). These aren't things I usually have, ah, control over. So the incident report is this…	
1:05:00	Now. A disconnected cache miss has occurred on the object. /bovik/thesis/dissertation/intro.tex. The object was referenced by– How much do you believe this cache miss will affect your current work? Invalid. Not at all. This is a practice disconnection. I am not currently working on my thesis. Don't even have a B.S. degree. This will not affect me all. "Please choose a value from 1 to 6."	149
1:05:??	OK. The network is back up. Wonderful. Tokens. Tokens have expired. Um. I would "submit", but I don't know what the password is. I am not familiar with reintegration.	239

D.13.3 Debriefing

The user was debriefed on tape, but nothing is audible on the tape.

D.14 T1

As Participant T1 began our experiment as Participant N3. However, as this user began reading the Tutorial's introductory screens, he realized that he actually knew more about Coda than he thought – as evidenced by the comments at Tutorial times 2:06, 3:10, and 20:30. For this reason, we did not include him as a novice user.

D.14.1 Tutorial

Time	Transcript	ID
	[Pink ≅ the walls] The walls? Like this red color?	285
	[Skips second half of paragraph 2 of Introduction4]	124
2:06	"A consequence of this is that we can voluntarily disconnect…" I know that.	
3:10	[Use hoarding to combat this problem.] Oh, by the way, I know about, a little about hoarding too. I didn't put it down in the questionnaire.	
	[Appears to have skipped 4th sentence of paragraph 2 in Introduction6.]	124
	[Questions whether it's really 4 orders of magnitude.]	
	[Appears to have skipped 2nd and 3rd sentences of paragraph 2 of Introduction7.]	124
6:20	[Dashboard indicators– example of having to pull over to side of road five minutes ago or risk serious engine damage.] Hmm. I don't understand that.	286
	[User has some difficulty identifying the indicator lights window.]	111
7:00	I wish the color's brighter I guess. The green's kinda, um, low– ah, not, dim.	264
7:21	[…the green means everything is normal.] Maybe bright green's better. Um. If something were busy. Well, I guess it would catch his attention too much when you're doing work so dim green's good I guess.	264
8:15	[Note that there is a Help button on every screen in the interface.] Uh, where's the Help button? [Looking at indicator lights]	45
8:30	Ah! This is annoying. I'm just moving the, ah, window [tutorial] to the middle so it's not so low.	1
9:40	Sigh… Why does it always go to (that) position? This is annoying.	1
	[Skips much of 1st three paragraphs of UrgencyColors2.]	124
11:00	[User is not sure what the "For the record" comment in UrgencyColors2 means.] So, I wish these things are in color, so maybe I'll click on the– the or– the critical and then I'll choose the color from these buttons would be a lot easier for me to use.	287 91

	[On Network1] I wonder what "weak" means.	229
13:05	Oh! It's flashing! Network goes down automatically? But, how do I know which files in which server? This is strange. I wish somebody would tell me that.	129
	[Please close.] What if I don't close this? See what happens. It closes itself! Yeah. Huh. That's cheating. I didn't close it myself.	
	[Skims sentence 2 of Paragraph 1 of Task1.]	124
14:10	Yeah, but latex is a hard one because you have to get all the fonts and styles. This is not clear this is an easy thing to do. Um. Even emacs needs a lot of lisp files.	
	Oh. This didn't go away. I'm sorry. This is weird.	121
	[User skips Paragraph 2 of Task2.]	124
16:40	[User would like to highlight things in tutorial to mark spot.]	130
17:30	[Task4 is very confusing to user.]	288
18:50	[User misses scrollbar on Data Definition window.]	131
19:40	[User attempts to resize window– ugly.] Why is there all this empty spaces here? Why doesn't the space get used here. This is kind of strange.	4
20:30	[User skips meta-information description Paragraphs 2 and 3, in Task7.] I know that; I'll skip.	124
21:00	If you resize sideways, I wonder if this shows the whole thing. It still doesn't show the whole thing. That's weird. … slight annoyance… [User wants to see full pathname in data definition, also wants the interface to either resize properly or forbid resizing completely.]	4 21
	[Difficulty finding black down arrow.]	34
	Hit <Enter> to move the cursor down. I wonder if I can just click. Yeah. It works. Cool.	
	[Type in pathnames, feel free to make some up.] Sigh. It's being– not very creative.	
24:10	[Trying out <Tab> in Data Definition.] So, can you do <Back-Tab>? <Back-Tab> doesn't work, but <Tab> works.	132
24:50	Oh, by the way, if I'm typing a path like this random thing, maybe this I want this to be a path but how do I know what's in the file system? I guess. Only if you're a Unix user, you know there are certain directory that has to be there in order to test out whether something's a directory.	94
	[Iconifies Task Information window.]	
28:00	[Program definition– click on black down arrow button.] That's good. This is consistent.	
	X cut and paste is not working. That's annoying.	133
29:00	[Use ghostview rather than Scribe?!?]	
29:10	[Please close all windows titled XXX.] Why does it keep on saying "close all windows" instead of "close the window"? There's only one of them, right?	134

30:15	[Task16 instructs user to add "with latex" after "writing" and save.] Type "with latex". So this is changing. Ah! That makes sense. Click the Save button. OK. OK. Eh, it changed! Oh! It created a new one. This is bizarre.	5
30:35	I don't see a difference between these two, but the window seems to move. That's weird.	135
31:30	[Fix the name and hit <Enter>.] I hit <Enter>, but it doesn't seem to do anything.	136
31:55	[Click on name and hit <Backspace> or <Delete>.] That's good. That's easy.	
32:30	[Realizes mistake in Program Definition.] This is weird. I have a path here, rather than these funny names. I must have done something wrong.	137
32:?? 33:15	[User tries to delete program definition by clicking on program name in "predefined" list and hitting <Delete>.]	138
33:30	Where the heck is Scribe? Writing with Scribe. I'm very confused. Uh.. Scribe Tools… will start in the program predefined list– program predefined list. Did I kill Scribe by accident? I don't see Scribe in here… Maria, I can't find Scribe Tools. Did I delete it somehow? **There is a known bug. It is possible you deleted it without realizing it. So why don't you go ahead and redefine it?**	139
	How do I– oh– So how do I do that? I don't remember. I go here. I go "New…" And I just say Scribe Tool. But I don't know the path. **You may assume everything is in /coda/misc/bin.** OK… And is it just called Scribe? **Yes.** Great. Thank you. **Ah-huh. … Sorry about that.** Nothing … sorry about that. I must have done something– weird. **No, no, no, no. There is a <u>known</u> bug.** Oh. OK. **That didn't crop up until after we started the study. So I'm not allowed to fix it.**	
	[User gets hit with double-select bug?] Oh, it just showed two of them.	22
35:20	I'm supposed to be able to delete it like this, but why is it not deleting? That's really strange. Um. I expected to– so I don't know why I can't delete it. I mean. I wish I could click and delete– click.	138
35:50	[Save] I wish there's a indication that actually the Save is successfully done somewhere. For example, in emacs, there's a button that shows something is modified. So that would be a good thing to have, because I kept on clicking with Save and it just depressed and came out. And God knows if it actually did anything. OK. Just something that would help.	59
	[Should now be looking at Task Information.] **You iconified that window.** I did? **Yeah.** I didn't kill it. Thank you. **Yup.** :	208
36:55	Yeah, but if I click on it, it should deiconify or start a new one. Anyhow…	

37:40	[Use a bizarre form of drag-n-drop.] What's a bizarre form– ? : Oh, you don't hold the mouse– you click and let go. So, this is not really click and drag, right? Or drag and drop so you shouldn't say that. It's confusing.	289
38:10	[TaskUnavailable event causes system to beep three times.] Eek. It's having problems. Bad connection. No good. How do I repeat? What do I do? What do I do? [Reads last paragraph] … Yeah, but how do I do this with hacking device? Eh– I'll do it anyway.	261
38:45	[Meter showing availability of Task(s).] But, what good is it to get 80 or 90 percent? I mean, it's all or nothing, right?	268 114
	[Tries reprioritizing.] This is weird. It doesn't seem to work completely. [User seemed to be reprioritizing into same priority position. I think it may be confusion as to where you click to put the task in a specific priority.]	42
42:50	[Advice blinking red.] It's not blinking anymore. Wait a min– it will change to red. So it only blinks a little bit I guess.	33
	[User answers weak miss questionnaire. Then, reads instructions telling him to do so.] What questionnaire? Oops. Clicked too quickly. Missed something.	
44:??	**You just did exactly what the directions told you to do.** Yeah, but I missed the questionnaire part. What questionnaire? **What you saw <u>was</u> the questionnaire.** Oh! Oh! That's just a question. OK. I thought a question– that's my English understanding– I thought a questionnaire was more like a big form with lots of questions. **Nah– just a little one.**	230
	[Sighs.] This is a lot of reading.	
45:40	I wonder what's the time out for the second question. [of weak miss series].	
	Hey! It's blinking again. It's gone again. Cool.	33
	[Skips all paragraph prose on HoardWalk1.]	124
47:55	It's actually hoarding?! The disk is not spinning. But anyway.	
48:15	Why? […does the hoard walk indicator change to yellow?]	258
48:50	Everything's blinking now. Why is it blinking red color and then green and yellow? Shouldn't it be staying at red? Oh, it's changing the color to red.	9
51:35	Why is this a toggle? [Fetch and Stop Asking]	141
52:20	["+" and "-" on tree widget.] I guess the convention for these signs is a downward triangle. I mean this in windows that's what it looks like so maybe it's nice to use the same conventions. But "+" and "-" are also very intuitive. But if you put a triangle here, I would need instructions. I	142
52:50	would know I can click on it. I no– wouldn't know– I probably would try clicking on it anyway. For example, I can click on these guys too– That's very nice! Ah. This is cool. What if I do this? Ah. This is nice. So if I expand it again, does it remember? Yeah. It remembers. This is a very nice interface. Cool.	

	[Skips all paragraph prose on HoardWalk5.]	124
53:20	[User is presented with unselect question.] That's silly. You somehow select these two and it asks this stupid question.	140
	I'm not understanding this very well… This is annoying. This is a <u>single</u> file. Why is it asking me those questions? I mean I'll understand if it's, like, under a subdirectory, like this, and the questions should probably, should be around here somewhere so I don't have to move my pointer all the time. This is a funny place to place the questions.	140 1
	Task is blinking red again.	
55:??	Wow! This 70% is not in the box. Bad. Bad. Bad. Bad. Bad.	77
56:??	[RVM full Help window.] That's useless. Well, I guess it's useful– at least I know who to talk to, but I can't fix it myself. That's not good.	76
56:45	[Cache filling Help window] [User skips top part] Be careful not to hoard more data -blah, blah, blah than will fit in the cache. I can make my cache bigger. How do I make my cache bigger? You're not telling me that.	76
57:15	Why is my network still yellow? I don't understand. These guys are not yellow. Well, I guess, when it's 1% if it's yellow, I would like to see the fonts in yellow. I don't understand this. This is strange. They're all black.	8
	Why not list this [indicator lights] in order?	143
58:40	I would rather use klist.	144
1:01:40	So maybe we need a system default just in case I screw up so many times and then I'd like the original.	145
	[User is looking at Advice Information window. Asks for help.] **Right. You can close this window. Try reading the help.** This Control Panel allow you to configure events notification. The left half of the screen allow you to select the event you would like to configure… **Oh, this didn't get updated. Go ahead and click OK. Let me rewrite a new help window. Suppose the help window said. Um… In the upper left corner of the screen, you can select the indicator under which the event is notified… Then, in the lower left corner, you can select the event that is indicated.**	251
	Sigh… I'm not very good at instructions. [Not sure what he's referring to here… something about "commit".]	
	The user apparently changed the configuration of the "Read Disconnected Cache Miss Advice" event while exploring on his own. It no longer showed that it was disabled. User was confused. Experimenter restored it to the "default" configuration.	
	[User does not understand "Under the 'Network'" indicator. Figures it out.]	290
	I wonder why all the windows open to the corner.	1

D.14.2 Exercises

Time	Transcript	ID
2:20	[Urgency colors] So, this windows. Hmm. OK. Just trying to see if it stays on. I guess it doesn't stay on if you start dragging– it only stays on if you click once. Oh, well.	146
	[One or More Task Unavailable event] Under what condition will the "One or More Task Unavailable" event occur. Under what condition would the "One or More Task Unav–" huh? Under what condition would the "One or More Task Unavailable" event– so that's event. Ah. [?] I don't remember. I don't remember where event is. Let me see. Control Panel. Tokens. Space? What's in Space? Oh this is how much space I have. Oops. Um. Advice. There's no advice. Hoard Walk. Let me see. Maybe it's in here. Nope, it's not in here (It's in) Tasks? This is the most complicated one. One or more tasks event would be unreadable. Don't know how to answer that question. Does the interface notify the user of this event? What urgency level? Maybe it's in here. Urgency Color. Event Configuration. That's it.	275 147
	[What tasks are currently defined?] There are many! What tasks are currently defined? I'm not gonna type all of 'em, right? What tasks are currently defined? Too lazy to type. I'll just type a few. : Which of these are hoarded? SOSP16. Recommendation letters. Oh. Sigh. Oh. Yicky highlighted color! (But, you) will do.	84
8:30	This 2% doesn't show up very well, so, because the color doesn't show up. It's almost– it's as– it's very misleading, I mean, I look at 2%, and it takes me awhile to realize– well, it's not [mumble].	8
9:50	[Hoard Walk Advice Request arrives] Ew. Something's flashing. Why is it flashing?	267
	[Hoard Walk window may have already been visible.] Hmm. What happened? I click on it and, uh, I don't see a window. Is this it? That's weird! Huh. Oh, well, I look at this instead. Um.	208
12:30	[Looking at Hoard Walk Advice request.] Hmm… I mean, of course I want a Darpa Grant. This is funny. Darpa Grant is not even one of those two choices. But also I want SOSP and I want recommendation letters. Um. : However, um, I'm still a little bit confused about– I'm still a little bit confused about when the task window, er I'm sorry, not the task window, the hoard walk comes up. Why is there, um, another– another one that says the Darpa Grant?	
13:05	[User double-clicks on the Hoard Walk indicator, causing the "Hoard Walk Information" window to appear. He then clicks on the "Help" button on this window, causing the a help window to appear.] Windows are jumping all over the place. That's really strange.	24
14:55	[Miss Event Configurations] [Read question twice.] Advice. [Looking under actual Advice indicator.] Hmm. Weakly connected. I didn't have anything under advice. "Weakly Connected Cache Miss Advice" and their configuration in the space below. Weakly connected. [Double-clicks advice, goes straight to the Advice indicator.] This is (really) strange. I'm not quite sure what this means, but, um, probably, "Weakly Connected Cache Miss Advice" and the	275 147

	"Disconnected Cache Advice" event. Oh– I have to type all this.	
	[How can we indicate that a window is already open?]	208
21:??	I don't need this. How come it does this? Save. This is weird. Oh! It finally showed up. I don't understand why it take so many clicks. Oh! It only takes one click and double-click means that pop up the window. Oops. Didn't understand that earlier. Oh well.	291
22:55	I want all descendants– all descendants. That's weird! Before I press return, I guess it doesn't know I want it so I can't click on these guys. Oh well.	20
	OK. I saved it. OK. Hm. That's weird. Task. Oh this is my window. Coda bug fixes. Oh I want this. Yes. OK. (?) this away.	
	[Header Files task] They are located in several places. Sign. So, am I supposed to do? Am I supposed to include them? Eh. Yicky.	{94}
	:	
25:25	You know something? You know, it might be helpful to have some sort a, of menu driven browse browsing like in Netscape so that I can actually be sure that I– like I didn't type in anything wrong, because this way it's kinda hard to tell whether or not, um, I'm typing something that's meaningful. Just a suggestion.	94
27:00	Another thing is, like, how do you know you need these header files, I mean, it's kinda hard to know. Is there a way that a program knows that the task– I guess it does because it suppose according to the manual he does. Um. Oh well.	185
28:??	I'm not quite understanding this. Um. Tasks and Subtasks. I guess I'm not understanding the distinction very well. Oh well. I'll just start from scratch.	211
29:15	[Save] How come this doesn't go away when I save? That's another interesting, um, thing.	59
	By the way, when you click "close", if something's modified, maybe it's good to have a warning saying that do you, are you sure, the thing has been modified, do you– are you sure you want to close this? I mean, this way I may not, you avoid me from accidently losing my changes, um, there, I meant to make.	127
	[Prioritizing Tasks] Wow! There's so many of them in here. So I guess I should delete 'em, right? How– How do I delete these guys? Would <Backspace> work? Oh, cool. It actually works.	102
	:	
31:??	So a question is that if I'm not hoarding a task, does this mean it'll be removed from my d-disk? Or will it stay there if it's already there? So that's another thing I'm not quite clear on playing with this.	242
	[What day is it today? How many days until Tuesday?]	
32:30	A true drag, it would be better. Um, drag-n-drop, rather than a– cl-cl– you know, the right button kind-of, ah, false things you have. It's slightly confusing without it.	42
	Catastrophic Failure caused by parenthesis in Task name. There was a relatively long break before we were able to continue. During this time frame, the experimenter recovered all of the data from before the failure, and then restarted the Exercises at the point of the original failure. This resulted in the loss of the time for the "PrioritizeTasks" exercise (the point of failure), which in turn meant that the two summary times that included this timing were also invalid.	89
	[Prioritizing Tasks] Wait a minute. CV. Hmm. I forgo– Oh! There we go. Finally. Took a while to move. [User reprioritized task into same position.] Um. Bug fixing. And, ah, Headers– parens. So, another thing is that it would be good if I add something that	42

51:30	thing would be shown on the screen rather than just shown on the scrollbar, I mean, otherwise it's kinda hard for me to see or actually add in something else.	43
54:00	There's something funny about the Task. Why is it blinking red? I've got 100% of everything. Why is it was it blinking? Oh– it's not blinking anymore.	9
	[Doesn't bother reading tetris manual excerpts] Yeah– I think I know how to play this game. I don't need this.	124
55:40	[Moves window]	
	Ah! Space is going cuckoo. Should I keep on playing?	
	OK– I'll send him mail. Where's my xterm? **You do not actually have to take the action– so whatever actions you describe here you do not actually have to take them. Just tell me what you would do.**	
	Please describe all incidents– even those going from bad to good.	
1:01:30	[Does a Hoard Walk– interface does the flip out on the hoard walk progress meter.]	
1:07:10	Advice. Weak miss. We missed the thesis dissertation. Estimated fetch time. My dissertation. Of course. Do I want to fetch? Hmm. I don't remember this. Do I– Yes– I need more time. I don't remember this part. OK. Bad network connection. I never asked to fetch the thesis. Why is it fetching the thesis? I don't want to fetch. That's silly. OK. It's a warning light. I think. I forgot what color it is. Oh. It's red. Got to be red.	149
	[Disconnected Cache Miss Questionnaire: How much will this affect your work?] Not at all; it won't. This is a new one. Network is bad.	149
1:11:20	[Please choose 1-6 (on Disconnected Cache Miss Questionnaire)] Please choose– I did. I choose 0. Please choose a level 1-6 by clicking on your selection. I don't understand– that's a 0. I don't care about it. Well fine. I'll do 1. That is weird. I should be able to say 1.	150
1:14:30	It got stuck. It's not moving. Hey! What's going on? [Submit button is "frozen"] **It'll come back. You don't know the password. It's okay.**	104
1:15:26	Sigh. Reintegration is red. So what the heck does that mean? Token is also bad. Oh I can't fix either one. Reintegrate Now. I don't know what this means. Well, I guess I can read Help. Fine. I'll read help. [Reads] Oh. So I need to reintegrate. Why do I need to reintegrate? I guess something must have changed. OK.	239
	What the heck! You have now completed exercises?! I'm not finished yet. [User was still filling out the final incident report when the final screen popped up.]	151
	[No feedback from "Reintegrate Now".]	

D.14.3 Debriefing

Time	Transcript	ID
	[Difficulty understanding the questions that asked about event configurations.]	275
	[Interested in using fast Coda laptop but not 486-based.]	

[What do you know about hoarding?]
I heard the term before, and then I understand it as the– you select a bunch of things you want and then you hoard it for you. But it's still not quite clear that, at this point, it's not quite clear to me that it actually knows to, for example in emacs, it knows to hoard all the lisp files I need. Or in latex, it hoards all the fonts and the style files. And, it's not clear, you know, that it's doing that.
Even now?

I read something that says something in the tutorial that says you do it a couple times, observing when you run, but that's not enough because what if I'm doing something that's– from– what if I'm starting something, for example all of a sudden I start in lisp mode, and else it can't find certain files. I mean, that's not, not good enough. I need something to be able to let me say "I want them all." (chuckles) I guess I do have that, yeah, in a sense I do, but then I have to search to get the subdirectories myself. So I have to be some sort of expert Unix user or I have to know how this, ah, program is looking at things. I have to understand this program well to know what to hoard. So, in order to do the hoarding right, I guess– guess is already the hard problem. And the thing is that part is never quite, um, emphasized or anything later on– so it's just a vague one line that say that, I had to remember. And so, for example, if I'm clicking on hoarding now– I'm not seeing the same– getting this file, getting this file, getting this file. You know. It's like. Sometimes you could like display something really quickly and then I know what's going on. Or whether it's just hoarding this one thing. 244 243

So you'd like to be able to go down and see what that definition contains? 153
Yes, if I want to.

Yeah, so it's still not clear, right? In the Task, you say get "all descendants" or get one level descendants. But there's still nothing says that when I'm, when I'm running this, it's actually getting things I want automatically. I don't see that– I guess I'm missing that part. Where in the interface is it allowing you to do that?
The programs will do that, but the user data doesn't.
[Explanation]

[Menu-driven browsing– N3 describe what he means– very similar to gnu-emacs– intended to avoid typing pathnames.] 94

[Would like to see indication that window needs to be saved.] 59

[Likes to be able to close without saving to abort.] 154

[Show user how you can click before and after. Finds 'no-man's land' where it doesn't recognize. User's intuition is to drop anywhere on 1st element to drop into 1st spot, as opposed to top half of 1st element!!] 42

[Suggests flash Green → Almost Black.] 9