What's my Daily Value? Interpretation of network performance metrics in broadband consumer labels

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ABSTRACT

Despite the importance of residential Internet, choosing Internet plans is often an opaque and frustrating process for consumers. To address this, United States regulatory authorities have proposed "broadband consumer labels", akin to nutrition labels, to improve transparency and empower consumers to make informed decisions, but to achieve their goal, such labels must both capture information relevant to consumers while being interpretable.

In this paper, we present the results of a qualitative interview study with Internet consumers in rural/suburban communities in the Appalachian region of the United States. We find that network metrics typically used to characterize Internet service plans in proposed broadband labels, such as speeds and latency, are difficult to interpret and do not capture valued attributes of Internet service such as reliability. As a result, consumers to adopt a variety of social strategies to map their perceived needs to advertised offerings. We conclude with implications for proposed broadband consumer labels.

CCS CONCEPTS

• **Networks** → Network reliability.

KEYWORDS

broadband, network performance, human-computer interaction, home Internet

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1 INTRODUCTION

Despite the steep acceleration in Internet usage of recent years [18, 19, 21], the process of purchasing Internet service has remained frustrating and opaque, preventing many consumers from determining whether a given Internet service plan adequately meets their needs. Typical advertisements for an Internet service plan might display advertised costs that fail to communicate length of contract, additional monthly fees, or post-introductory pricing. Further, consumers often have to navigate a world of Internet measurement vocabulary that communicates little to no information to the average Internet user [10]. Advertised Internet service plans commonly describe service quality in terms of metrics such as maximum download throughput in megabits per second (e.g., "speeds up to 300 Mbps") or data caps measured in bytes (e.g., "500GB per month"). At best, these metrics can be challenging for users to contextualize in terms of more tangible aspects of service quality such as types of applications or number of devices that can be supported; similarly, these metrics exclude other potentially highly relevant aspects such as service reliability.

In 2021, the United State Federal Communications Commission (FCC) began the process of requiring broadband providers to display easy-to-understand consumer labels, with the intention of providing transparency to consumers making Internet purchasing decisions [12] to improve market competition among ISPs. Figure 1 shows the latest iteration of the proposed consumer label. These broadband consumer labels aim to simplify comparison shopping for consumers by standardizing how Internet service providers (ISPs) report service costs and performance, including metrics like download speed, upload speed, and latency. In principle, standardizing this information enables consumers to more directly compare available service offerings and make informed decisions about Internet service plans that meet their needs. For consumers, choosing an appropriate Internet service plan is important: a plan that does not meet a user's performance requirements can lead to a poor Internet experience and result in digital exclusion [3], whereas a plan that is excessive for a user's needs can lead to unnecessary expense.

Our observation is that the objectives of the FCC's broadband consumer label program are compromised if the information available on the label is not *interpretable* by consumers. Informed decision making requires not only transparency and comparability, but the ability for a would-be user to relate network performance to their needs in terms that they clearly understand. Indeed, dietary nutrition labels, the direct inspiration for broadband consumer labels, faced interpretability challenges in their early history prior to the introduction of "Percent Daily Values", with consumers misinterpreting values with different units (e.g., "100 mg" versus "1 g") or having difficulty contextualizing whether a value was a large or small amount [26].

In this paper, we examine how older adults interpret commonly-used network performance metrics and use these metrics to inform decisions about purchasing Internet service. To do so, we conduct a series of semi-structured interviews in a mixed rural-suburban community in southwestern Virginia. As part of our interviews, we

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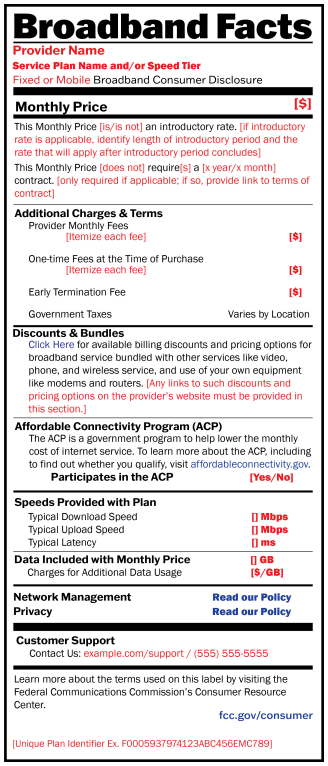

Broadband Facts

Provider Name

Service Plan Name and/or Speed Tier

Fixed or Mobile Broadband Consumer Disclosure

Monthly Price **[$]**

This Monthly Price [is/is not] an introductory rate. [if introductory rate is applicable, identify length of introductory period and the rate that will apply after introductory period concludes]

This Monthly Price [does not] require[s] a [x year/x month] contract. [only required if applicable; if so, provide link to terms of contract]

Additional Charges & Terms

Provider Monthly Fees [Itemize each fee] **[$]**

One-time Fees at the Time of Purchase [Itemize each fee] **[$]**

Early Termination Fee **[$]**

Government Taxes Varies by Location

Discounts & Bundles

Click Here for available billing discounts and pricing options for broadband service bundled with other services like video, phone, and wireless service, and use of your own equipment like modems and routers. [Any links to such discounts and pricing options on the provider's website must be provided in this section.]

Affordable Connectivity Program (ACP)

The ACP is a government program to help lower the monthly cost of internet service. To learn more about the ACP, including to find out whether you qualify, visit affordableconnectivity.gov.

Participates in the ACP **[Yes/No]**

Speeds Provided with Plan

Typical Download Speed **[] Mbps**

Typical Upload Speed **[] Mbps**

Typical Latency **[] ms**

Data Included with Monthly Price **[] GB**

Charges for Additional Data Usage **[$/GB]**

Network Management **Read our Policy**

Privacy **Read our Policy**

Customer Support

Contact Us: example.com/support / (555) 555-5555

Learn more about the terms used on this label by visiting the Federal Communications Commission's Consumer Resource Center.

fcc.gov/consumer

[Unique Plan Identifier Ex. F0005937974123ABC456EMC789]

Figure 1: Sample Broadband Consumer Label as proposed by the FCC.

also explore how the proposed broadband consumer label standard intersects with existing decision making approaches for choosing Internet service plans, identifying missing aspects of Internet service quality relevant to the experiences of our participant population.

We find that consumers rely on trusted friends and family to translate between perceived service requirements and network performance metrics stated by ISPs in a manner paralleling *intermediated usage* [23], suggesting a role for social support in evaluating service performance claims. Similarly, in line with prior work [9, 11], we find that network performance metrics provided on the proposed broadband consumer labels, including throughput and latency, are not interpretable, with our participants relying on guesses and provider marketing to determine how their needs map to service plans. Next, we observe that our participants mapped valued aspects of service quality, such as reliability, to imperfect but concretely observable attributes of Internet service, such as the type of technology used by the ISPs.

From these findings, the contributions of our paper are (1) an interview study exploring how older adults in a rural/suburban US community use network performance metrics to inform choice of Internet service plans and (2) a set of recommendations for the design of broadband consumer labels to empower consumers to make informed Internet purchase decisions.

2 BACKGROUND: THE BROADBAND CONSUMER LABEL

In November 2021, the United States Congress passed legislation directing the FCC to develop regulations requiring the display of "broadband consumer labels" by Internet service providers. These broadband consumer labels – first introduced in 2016, though never formally adopted – aim to support consumers in comparing Internet access service plans by standardizing the service metrics and offered prices, introductory rates, and length of contract advertised by both home and mobile broadband service providers [4].

Following this ruling, through a set of hearings and an initial request for comments from the public, the FCC found that "consumers are often confused by the complexity of broadband service offerings, terminology, and pricing" and that "most commenters urge the Commission to modify the [original 2016 labels] to better assist consumers in their purchasing decisions" [5]. Comments were submitted by a range of constituents, ranging from individual consumers to advocacy groups from civil society. Thus, in a call for a subsequent second round of public comment, the FCC sought feedback on an additional range of broadband consumer label features, including but not limited to accessibility and languages, price and performance information, and network management and privacy policies [5].

3 METHODS

ID	Description
P1	female, 70s
P2	male, 60s
P3	male, 60s
P4	male, 70s
P5	female, 60s
P6	female, 70s, spouse of P7
P7	male, 70s, spouse of P6

Table 1: Interview participant demographics.

To better understand how consumers interpret network performance and leverage broadband consumer labels to make informed choices, we conducted an interview study in our community. Our interviews focused on fixed broadband, as fixed broadband Internet is typically used by a broader range of devices and potentially requires more complex Internet usage reasoning by consumers. Our participants were aged 60 years or older and residents of rural or suburban communities of southwestern Virginia, in the Appalachian region of the United States. We recruited through flyers posted at local community centers, via Facebook groups for residents of two local towns, and through emails to the local chapters of community organizations such as the Ruritan Club and AARP. We chose to focus on older adults in our study due to the important role that Internet access can play for older adults' social support and well-being [13], as well as the risk of falling victim to misleading marketing [22].

Data was collected from six semi-structured interviews with seven participants total. Five of the interviews were held one-on-one; an additional interview was conducted with both members

of the household present, in an effort to capture the dynamics of household decision-making.

The interview was structured in three sections. In the first section, we aimed to establish participant Internet usage at home and current Internet service quality. Participants were also asked to self-evaluate their personal use of Internet-enabled devices and applications.

In the second section, we asked participants to describe previous experiences purchasing Internet and conducted an activity in which participants were asked to role play how they might purchase a new Internet service plan, asking as though they had just moved to the area. Participants were provided with a laptop to use if they wished. If a participant indicated that they would contact friends or family to ask any questions, the interviewer assumed the role of these figures and answered to the best of their knowledge.

In the last section, we introduced the broadband consumer label to participants and asked for their initial impressions about the usability of these labels. We then gave participants three broadband consumer labels representing three tiers of Internet service plans from an imaginary provider and asked them to pick a plan they felt best suited their household's needs. Finally, we asked participants to list three to five of the most important traits that a should be included in the broadband consumer label. The purpose of this was to capture any changes in the participants' thinking over the course of the interview, as we felt that the process of participating in the interview may have facilitated the formation of new opinions.

All interviews were recorded and transcribed. From the transcripts of the interviews, the lead author used inductive coding and thematic analysis to identify emergent themes.

4 RESULTS

4.1 Interpreting performance metrics

Most of our applicants struggled to understand what latency, upload/download throughput, and monthly total data amount they required for their household, mirroring prior work [9].

P2's experience during our Internet purchasing role playing exercise was characteristic of our participants:

> **P2:** So you get a gigabyte a month. I don't know what that means. Does that mean I can look at the Internet every day or I can't? [...]
>
> Wow. [This Internet speed] seems like a lot. 1200, a thousand... But I don't have any clue... [sigh] See, this is where I would probably already call somebody. Because it's an overwhelming amount of information. [...]
>
> Even when [my Internet speed] was three [megabits per second] – yeah, it was okay... I really didn't know what I was buying. Yeah, I remember there were, like, three categories, as they always are... I lived with three and now the lowest you can get is the 200 [megabits per second plan]. So do I need 400 or 800 [megabits per second]?

P2 struggled to understand how to convert a monthly data cap of one gigabyte into his own typical daily application use, which primarily consisted of reading online newspapers and other text content. He also felt overwhelmed by the download speeds advertised by an Internet service plan he found online, as the value advertised seemed much higher than the network speeds he had previously purchased. Part of the reason for his confusion was that during his previous experience purchasing Internet service, he had purchased a plan with much slower download speeds. While making this previous purchase, P2 also had no idea how the advertised download speed related to his own Internet usage, and therefore could not use his experience with this speed as a benchmark.

Another participant specifically requested that the broadband consumer label made Internet service providers communicate how service plans met specific household usage:

> **P1:** I want [the broadband label] to be something where [Internet service providers] could say, well, plan A meets your current needs. If you think in the near future you're going to be adding [more Internet-enabled devices], then maybe plan B would be better.

Both P1 and P2 (and most other participants) may have benefited from a table listing application Internet speed and latency requirements to help them convert the measurements advertised by service providers to their own household's need. Such information has been published online by different organizations, including the FCC [1, 2]; however, during the role-playing activity none of the participants used the computer to look up these resources.

In the above quote, P1 also references how reasoning about changes in future household Internet requirements ("adding more Internet-enabled devices") is made easier when Internet service level is described at the application level. In general, we found that participant confusion around Internet speed measurements and monthly data usage limits made it difficult to for them to reason about more complex usage edge cases that might require them to buy a higher tier Internet service plan. For example, P2 was unsure whether 75 megabits per second of download speed and 500 gigabytes of monthly data would be enough Internet service when accounting for visitors to his household.

> **P2:** On the basic plan, I would be thinking it's probably okay just for me, if I'm going to do is sit here and look at my iPad, that's probably good enough. But other people are going to come, other people are going to use this. And I'm concerned that 75 is not enough. I have no idea what 500 gigs is, but I'm going to guess that I alone probably would not use more than 500 gigs. But if other people come, they might.

P7 estimated their household required more than 300Mbps of download speed:

> **Interviewer:** How did you arrive at 600 megabits per second [for your Internet plan]?
>
> **P7:** Oh, I don't know, just knowing the amount of streaming that we do... She [my spouse] does a lot of podcasts... She's on the Internet quite a bit during the day. I'm also on an iPad. That's just my rough estimate. [...] We can't go less than 300, that's for sure. But with that in mind [...] I don't see a big difference between 1200 and 300. You might be getting just 300, you know what I mean? Because I don't see a big

> difference for what we do. I don't think YouTube TV is coming up any faster.

Here, P7's estimate of the network speed their household required seems high given their reported household's usage consisted of two people who engage in web browsing, listening to podcasts, and occasional video streaming. Anchoring on the responsiveness of a specific application (here, YouTube TV), P7 expressed ambivalence about the difference between the higher speed tiers offered by their ISP.

P5 recalled that some providers used to list the approximate number of devices supported by a service plan, in addition to advertised speed, latency, and monthly data usage limits.

> **P5:** 400, 800, 1,000 [megabits per second]. See, that's the thing, is I don't know what I need. I don't know what those numbers mean. So how can I figure that out? It used to be different, where I could easily see [the number of devices supported by a plan]...

Such "contextualized" descriptions of offered service plans are commonly (though not universally) offered by ISPs and can include number of devices or types of applications a plan might support. However, some participants found information given by a provider untrustworthy. P1 expressed a reluctance to trust any responses given by a provider due to their incentive to sell their service to consumers.

> **P1:** So if I had gone into wherever Verizon and said, "Can you tell me about your plan?" And they said, "Oh, we have all of this," I would be immediately suspicious because they're trying to sell me something.

4.2 Reliance on trusted friends and family

We observed that our participants commonly requested help translating reported service speeds to their needs from trusted family and friends.

> **P6:** I leave certain things up to him [P7, the live-in spouse of P6]. Like the Internet speed. [P7 is] always checking that. It's like, I don't care. I just want [the Internet to work].

In cases where consumers (such as P6) shared a household with "tech-savvy" members, they might rely on such people to handle all Internet purchasing and management related tasks for the house. In cases where consumers lack a "tech-savvy" household member, consumers might rely on friends or family to provide advice, as P3 describes below.

> **P3:** [I talk to] my younger friends. It would be somebody ... who might be in their 40s that uses it a lot for work or whatever. I might ask the question, "For what [I] need at home, [is this plan appropriate]?... I should be able to get onto my work, email, those kinds of things."

The same participant, describing the last time they had to purchase Internet service, consulted with friends they considered "savvy":

> **P3:** [T]he few people that I know that are that savvy said, "Oh, no, this makes good sense for you to do that." So that's what I do.

Another strategy respondents employed to evaluate Internet service offerings was relying on the experiences of neighbors. Here, P5 describes that service quality information was most helpful when it came from local neighbors, with the recognition that service quality can vary across neighborhoods:

> **P5:** I knew that a lot of people in my area [used Xfinity] – and I understand, too, that some people in different areas of [town] even, maybe use that service but don't have good luck with it – but I knew my neighbors did, I knew my sister had used that for years, and it ends up being more expensive, but it's good.

Together, these quotes suggest that Internet service purchasing can be a highly social endeavor. However, questions remain surrounding how advice is interpreted or used, once received. Further research might also explore how socially isolated individuals seek help interpreting Internet service metrics.

4.3 Reliability

Prior work found that reliability was the second most important aspect of network performance behind speed to consumers [16]. At the same time, residential Internet service providers do not typically report reliability, nor does the current instantiation of the FCC's broadband consumer label provide information about service reliability. Our participants also valued service reliability:

> **P1:** I want it to always work when I fire it up. I don't want any fooling around. I want that service. It's true, I don't spend money on a whole lot of things, but I want that service to work reliably and without fool around with the quality [of Internet service].

> **P5:** My satellite provider was very spotty. It would go out [at] 2 or 3 o'clock during the day when I needed to be working. And so, this is why I changed to [my current] service. I pay more for it, but it's worth it to me. [...] [My prior service] was very economical, but I would call them because the Internet would be out and it would be hours, maybe even a day before the Internet was working again.

Beyond simply valuing reliability as a network trait, both P1 and P5 imply a willingness to pay a higher price for highly reliable Internet service. P5 specifically expresses that she is willing to pay more for her current service plan because of poor service reliability with her previous, cheaper provider.

One common proxy for ISP reliability that participants employed was the access technology used by the service provider. Some participants learned to associate access technologies with reliability issues both through insight from others. In P5's case, her tech-savvy sister informed her that satellite was the issue for her unreliable Internet connection.

> **Interviewer** Was there a way that you found out that satellite specifically might be your problem [causing] spottiness of the connection?

> **P5:** Well, I noticed that during weather events... – like, serious thunderstorms, that kind of thing – sometimes the Internet would go out. My sister is very tech-savvy. I talked to her about it, and she would have employees

> that worked maybe in [a nearby rural county]... where they needed to use satellite Internet because there wasn't fiber or cable. And she told me that that was an issue with the satellite type Internet.

P5's sister also implicitly suggests to P5 that fiber or cable Internet connections were more preferable than satellite. This was perhaps a common occurence, as another participant vocalized receiving similar advice from family:

> **P1:** My daughter says I should be going to fiber.

Other participants formed insight on the characteristics of certain access technologies from previous experiences. P2 learned to associate poor performance during bad weather with receiving Internet connectivity via satellite.

> **P2:** I'm aware of satellites because I had dish at the farm, and when the weather is bad, it doesn't work.

The general attitude of the participants was that satellite was unreliable and prone to longer downtimes.

Using access technology as a proxy for reliability places a burden on consumers to understand details of access network technologies, which can vary in subtle ways. For example, P5 appeared to conflate fixed wireless service, which relies on terrestrial radio links, with satellite based service:

> **P5:** From what I understand about satellites, it's difficult for them to diagnose anything remotely. They actually have to go out there to the top of the mountain or wherever it is and figure out what's wrong with it.

The tangible artifacts installed at the customer's residence for both fixed wireless and satellite service often consist of radio equipment mounted on a roof, but each access technology provides different affordances for performance and reliability. In this case, the folk understanding that wireless Internet service is less reliable in poor weather compared to wired service matches empirical observation [17], but this confusion highlights the potential pitfalls in using proxies to inform consumer decision making. A wireless provider that had designed their network appropriately to avoid weather-related disruptions, for example, could be dismissed by consumers despite meeting their needs.

5 RELATED WORK

The initial idea for an "Internet nutrition label" was explored by [25], in which the authors suggest a standardized collection of measurements that could be used in a government-supported broadband consumer label. This work proposed the creation of "interpreted metrics" for network performance that allow consumers to understand application network usage from traditional network performance metrics; in our study, we find that consumers indeed struggle with mapping latency, speed, and data usage metrics to application usage when purchasing Internet service and that there is a clear need for such "interpreted metrics".

Consumer confusion around household network speed requirements and monthly data usage has inspired the development of different network management tools. Researchers introduced network monitoring tools into the home to facilitate Internet service interpretation among consumers [7] and conducted field deployments of data cap management tools tp enable household members to interpret and control individual device data usage [8], extending upon previous research that uncovered how accumulating data usage, application data demands, and multiple, non-uniform Internet users impair reasoning about household data usage caps [6]. The existence of these technologies in the face of our findings raises the question of why consumers have not more broadly adopted such network insight tools.

In addition to affecting consumer decision-making around Internet service plan selection, lack of consumer understanding of device Internet usage may also be a barrier to the broader adoption of more complex data pricing schemes by providers [24]. In these pricing plans, the amount users pay for their broadband data might depend on auction results, congestion metrics, or time-of-day. The findings of this paper show that consumers may already struggle to accurately reason about making purchasing decisions when Internet service is quantified broadly by latency, throughput, and total usage and thus may struggle even more with pricing scenarios that require more complex calculus about household network requirements.

Some participants in our study resolved confusion around advertised Internet performance metrics by seeking help from tech-savvy friends and family outside of their household. Previous work investigates motivations for general computer support from such trusted friends and family [20], finding that helpers are influenced by factors ranging from urgency of help required to the desire to maintain their personal identity as a "computer expert". In our paper, we do not explore such dynamics of help in deciphering network metrics specifically, which we leave for future work.

Finally, in this paper, we identify the emergence of folk understandings surrounding the reliability of certain access technology. To our knowledge, this paper is among the first to suggest that user mental models based on visible Internet infrastructure may influence the interpretation of poor network performance and potentially lead to incorrect assumptions about the causes of poor network performance. Work conducted in the security community has previously explored how users' mental models of networked computer systems affect system usage, suggesting that botnets are so difficult to defend against because of gaps in folk models of security threats, viruses and malware, and hackers [27] and that perception of Internet security threats varies depending on users' mental models of Internet infrastructure (though these differences did not manifest in actions towards preserving user privacy or security) [14]. Future research might explore how consumer mental models of Internet architecture and function affects debugging of poor network performance, beyond switching the type of access technology.

6 DISCUSSION

6.1 Social support in interpreting network performance

A theme throughout our interviews was the role of social support in interpreting network performance metrics and mapping consumer's needs to available Internet plans. Indeed, reliance on "helpers" by older adults in the context of home Internet is well-established,

with examples of teens assisting older adults along the Internet adoption journey [15].

In our study, we observe that the ways in which our participants used broadband labels in our study parallels examples of *intermediated usage* [23] in the ICTD literature, in which individuals rely on trusted assistants to access technology that is otherwise inaccessible due to limitations in digital literacy. Our participants did not directly and individually use information available in the broadband labels to make decisions. Instead, the information was passed through trusted intermediaries who interpreted network performance metrics on their behalf.

This suggests that regulators designing broadband consumer labels can benefit by considering how labels fit into a larger process of decision making in which the individual consumer is reliant on others to make a fully informed decision. For example, broadband labels could be designed to be easily shared with a consumer's trusted helpers while a user is comparison shopping. This means that labels should be easily accessible by users outside of the given plan's service area, and should be viewable by multiple users simultaneously.

6.2 Implications for the FCC's Broadband Consumer Label

Broadband labels should contextualize performance metrics. Our participants struggled to relate advertised speed, latency, and monthly data allowance metrics to their household requirements. The labels should help consumers translate metrics, in a standardized way, into applications supported, number of devices, etc, as suggested by Cranor et al [11] or Clark et al [9]. This could be achieved by including links to existing FCC resources on interpreting network speeds and purchasing household broadband [1, 2]. Such context on application and device network usage requirements would also help consumers more easily reason about complex network use cases when purchasing Internet service. One participant suggested the inclusion of a "decision tree" to help consumers determine a network performance metric required for their household from a set of activities. These types of label additions help expand the broadband consumer label program to not only support consumer comparison-shopping, but also to provide guidance for consumers to understand their Internet usage needs.

Broadband labels should capture reliability. As found in prior work [11, 16], we find that consumers value service reliability highly alongside traditional network speed measurements. By including reliability metrics in the label, the FCC would not only support consumer decision making, but also reward providers who design well-functioning networks. Among our participants, we saw the formation of associations between certain access technology and poor reliability. Standardizing reliability metrics would protect competent providers from fallacious consumer reasoning by removing the need for consumers to form any assumptions about reliability. It appears that the addition of reliability metrics to the label is already being considered by the FCC, as in a recent Further Notice of Proposed Rulemaking, the agency sought comments on how to measure service reliability, with an eye towards incorporating such measurements into the broadband consumer label [5].

Broadband labels should consider social support. As covered in 6.1, we found Internet service purchasing to be a social process. Thus, a provider's broadband consumer label should at minimum be easily accessible across multiple users and different locations. By ensuring labels are shareable to third parties in this manner, the FCC would additionally ensure that consumers can hold providers accountable for advertised rates, mitigating feelings of distrust in service providers that we found among our participants.

6.3 Limitations and Future Work

Our study focuses on a small user population of older adults in a single suburban/rural region of the United States. While participants were aware of cost, affordability was not a focus of our study. Moreover, our participants had similar economic backgrounds, with many of our participants expressing financial security and an ability to afford making "incorrect" decisions. The strategies and values that highly price-sensitive consumers employ during Internet service purchasing, and how a broadband consumer label might be designed to incorporate any differences, remain open questions.

Further, one of our participants indicated that convenience was the primary reason for his last change in home broadband provider (i.e. he changed service provider to one that would include Internet service billing in a document he already received monthly). This is a reminder that consumers purchase Internet plans based on product qualities outside of network performance, which we leave to be explored in future studies.

Future work might also replicate our study in a different area of the country or deploy a wider-reaching survey to provide greater insight into the generalizability of our findings.

7 CONCLUSION

In this paper, we investigate how older adults interpret commonly-used network performance metrics. We uncover that consumers struggle to interpret network performance metrics such as throughput, latency, and allowed monthly data usage, and that consumers may often resolve their confusion by relying on tech-savvy friends and families to assist in comparing these advertised network metrics to typical household network usage. Additionally, we learn that consumers value Internet service reliability highly – a service quality not represented in current version of the broadband consumer labels – and find that they may form folk understandings of access technology qualities in order to predict network reliability. From these findings, we derive a set of recommendations to be considered in future iterations of the broadband consumer label. First, the broadband label should contextualize speed, latency, and monthly data allowance metrics for consumers. Second, the broadband label should include reliability metrics to both support consumer decision making and reward providers who design well-functioning networks. Finally, broadband labels should be broadly and simultaneously accessible by users in different locations to match the current, social nature of home Internet service purchasing.

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