

Using Snow Walls as Guides in Training Sessions for Persons with Visual Impairments:

Toward New Developments in Multimodal Interaction Analysis¹

Yasusuke MINAMI (Seijo University), NisiSawa HiroYuki (Seijo University),
Mitsuhiro OKADA (Seijo University), Rui SAKAIDA (Future University Hakodate)

ABSTRACT

Background: This paper describes how a person with visual impairment (PVI) navigates snow-covered paths. He usually relies on his white cane, tactile sensation through the soles of his feet, and auditory cues. Physical walls and curbs also serve as guides. How do these senses and utilization function in snow-covered areas?

Method: We conducted video ethnography of walking training sessions on snowy paths, employing multimodal interaction analysis. Data were collected in Japan. All the participants speak Japanese.

Result: The walking instructor's formulation of "a width passable by a person" perfectly matched the experience of the PVI. The PVI walked along the low areas between snowbanks, using the snow walls as guides and the compacted snow surfaces as lines that should be walked. He was surprised to discover he could not use the property boundary wall as a guide. Attempting to turn left using the physical wall as a guide resulted in him walking through deep snow. Based on this experience, he declared that he would employ a new strategy: feeling his way along the snow wall.

Discussion: Feeling his way along the snow wall requires adjusting the force with which the cane is swung. While this discovery and its mastery emerged as a challenge, the PVI found that he could walk by utilizing or adapting practices from non-snowy conditions. The PVI was using multisensorial resources slightly modified from those employed in snow-free conditions, and multimodal interaction analysis proved highly effective in specifying this process. Regarding navigation, it has been demonstrated that walk-line selection—determining which part of the road to travel—is as important as route selection.

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KEYWORDS

navigation, snow, multi-sensoriality, video ethnography, multimodal interaction analysis, person with visual impairment, line selection

1 Orientation and Mobility Training Sessions for Persons with Visual Impairments in Snowy Conditions

Familiarization is a form of walking training designed for persons with visual impairments (PVI) who have already mastered basic white cane skills to learn new routes (Shibata 2015). Minami et al. (2023) have investigated familiarization in Japan. They analyzed the practice of guided touch, where an orientation and mobility specialist (OMS) grasps and manipulates the cane held by a PVI, and identified instances where the practice was performed as two distinct types of demonstration. One type corresponds to the contrast between “claim” and “demonstration” (Sacks 1992), while the other type corresponds to “demonstration” in the sense of being contrasted with actual performance (Goffman 1974).

Due et al. (2023) described the phenomenon of stopping to examine obstacles on the road. While walking, PVIs attempt to detect obstacles by sweeping their cane 120 degrees to the left and right in front of them. When they notice an obstacle, they stop and use their hands to touch and examine its shape and other characteristics. Due et al. distinguished these activities using the terms “scanning” for the cane sweep and “inspection” for the hand examination.

Until recently, nearly all research on the walking of PVIs has been conducted in snow-free conditions (Due & Lange 2018a, 2018b, 2019; chapters in Due ed. 2023; Relieu 2023a, 2023b; Bouaouina et al. 2025). However, little is known about how PVIs walk in snowy conditions. This is the fundamental question of interest in this paper.

PVIs, broadly speaking, rely on auditory and tactile cues to obtain information about the external world. Examples of auditory use among PVIs include recognizing an approaching vehicle by its engine sound and determining their own direction of travel from its running noise. Tactile utilization includes the cane, soles of the feet, and direct hand contact. Although echolocation is an auditory sensoriality, one PVI employed the technique of striking the cane firmly against the pavement and listening to the resulting echo. The central research question is how these sensory utilizations manifest in the snowy season.

To jump ahead to the conclusion, one PVI (i.e., the research participant) utilized a cane, the soles of his feet, and his hearing. He used the cane to locate snowbanks and the soles of his feet to gauge the depth of snow on the road. His use of vehicle sounds and echoes was identical to when there was no snow, though the form changed due to the presence of snow. He walked by finding a

trodden path using the cane and the soles of his feet. The OMS initially formulated this part as “a width passable by a person.” The PVI understood this to mean the areas of snow that were lower than the surrounding snow because they had been stepped on. He had sometimes walked on areas that were not packed down but found it difficult to walk because they sank deeply. After that, he declared that he would walk on cleared or packed sections using snow walls as guides. Thus, one basic practice of walking on snowy paths was established.

Walking consists of moving one foot at a time. The question of when and where to place the next step is constantly at issue. It is an activity that is oriented toward the “here and now,” which is the central concern of ethnomethodology (Garfinkel 1967). As Ryave and Schenkein (1974) demonstrated, the decision of where to place the next step constitutes navigation itself. If two people walking in front are “withs” (Goffman 1971), then one will not walk between them.

When analyzing walking training for PVIs, it is appropriate to distinguish between two levels of navigation: which route to walk (route selection) and which part of the route to walk (line selection). Ryave and Schenkein (1974) primarily addressed the latter, line selection, while much of previous navigation research in ethnomethodology and conversation analysis focused on the former. For example, Psathas’s theoretical discussion of navigation and related concepts (1976) and research on “direction-giving” (Psathas & Kozloff 1976; Psathas 1986a, 1986b) both pertain to route selection. Haddington and Keisanen (2009), who studied conversations among passengers in automobiles, also examined “route selection.”

In the training sessions examined in this study, the route between the university campus and the destination railway station was predetermined. However, there were two options for entering and exiting the campus. The PVI and OMS used the main gate for the outward journey and a service gate for the return journey, resulting in a slightly different return route. Thus, the focus of this paper’s analysis is navigation—specifically, line selection. The PVI walked by sensing and following trodden paths in the snow on the sidewalk. Moreover, despite the presence of exposed areas, he deliberately chose to walk on the untracked snow that had accumulated.

In the section covered by this study, the PVI and OMS initially walked straight along the sidewalk of the main arterial road for a while (Figure 1). Regarding the road surface conditions, with snow piled up on both sides, there were areas that were packed down and low, areas that were exposed, and areas that were not exposed but had thinly packed, melting snow. This paper uses the term “trodden paths” to refer to these unexposed areas. Braille blocks (tactile paving blocks) were laid on the sidewalk. Some sections with Braille blocks had been cleared of snow, exposing the blocks, while others remained covered. The PVI and OMS then turned left off the sidewalk onto an eastbound road (Spot ⑤ on Figure 1). At the corner was a snowdrift with no trodden path. The

road beyond the turn had been cleared, but this corner was wide, and only the central portion had been cleared, leaving deep snow elsewhere. The PVI had to walk through that deep snow.

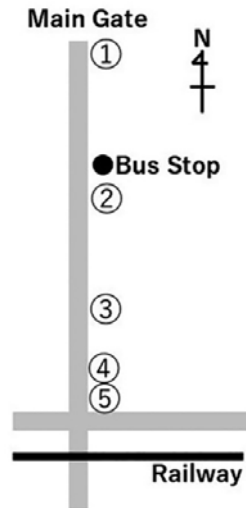


Figure 1 Map of Walking Route

This study focused on the first day of a series of training sessions. Walking on snowy roads was the initial activity targeted for training. Numerous exchanges were observed.

The rest of this paper is structured as follows. Section 2 introduces the methods and data. Section 3 examines two sequences initiated by the PVI, which took place at Spots ② and ③ in Figure 1. These sequences involve the PVI reporting his sensory experiences, serving as examples illustrating the sensation of snow. Section 4 examines how the PVI understood the formulation of road conditions presented by the OMS at the start of the training (Spot ① in Figure 1). Section 5 focuses on the sequence (Spot ④ in Figure 1) conveying “bad” news (Maynard 2003): the basic practice of using physical walls as guides cannot be applied because snow has accumulated right up to the edge of the wall. The PVI accepted this news after experiencing it firsthand using the cane and an umbrella. Section 6 covers the PVI walking through deep snow and learning a new practice for walking in snowy conditions (Spot ⑤ in Figure 1). Although the snow depth was unexpected, he overcame this challenge independently, declining the specialist’s assistance. The PVI then declared the adoption of a new practice: using snow walls as guides.

Overall, numerous sequences of interaction are observed regarding how snow is perceived and experienced by the PVI. Walking in the snow means walking on the snowpack. However, there are areas of the snowpack suitable for walking on and areas that are not; snow walls separate the two. The PVI learned this through direct experience.

2 Methods and Data

This study employs ethnomethodologically inspired video ethnography (Goodwin 2018; Due 2019; McIlvenny 2019; Cekaite & Goodwin 2021) based on recordings of walking training sessions captured from the front and rear by two video cameras, together with multimodal interaction analysis (Mondada 2019a, Mondada et al. 2021). These two methods are rooted in the combination of two traditions: ethnomethodology pioneered by Harold Garfinkel (1967) and conversation analysis pioneered by Harvey Sacks (1992). Speech transcripts were prepared according to the conventions developed by Gail Jefferson (2004), and embodied actions were annotated using Lorenza Mondada's conventions (2018, 2019b, 2022). Analysis and description are presented along with these transcripts.

The training sessions were conducted in A City, Japan, on February 12, 18, and 28, 2025. All sessions took place in the afternoon and lasted approximately 1 hour and 35 minutes, 2 hours and 40 minutes, and 1 hour and 55 minutes, respectively. Heavy snow fell on from February 5th till 11th, resulting in significant snow accumulation in many areas during the February 12 training. There was no substantial snowfall afterward, and snow accumulation decreased by the 18th and 28th. This study focuses on the data from the 12th because, in addition to the heavy snow, it was the first training session during the snowy season, and snow-related interactions were expected to be particularly frequent. All participants, including the two members of the research team, are native Japanese speakers.

The PVI who underwent training is a man in his late 40s, born and raised on the Pacific coast of the Tohoku region. He has been visually impaired since birth and became completely blind around the age of 20. He attended a school for the blind throughout junior high and high school. After graduating high school, he lived in the Kansai region and moved to A City on the Sea of Japan coast in 2024 to take a faculty position at A University.

On February 12th, two OMSs participated: one was in charge of the training, while the other one observed. The OMS in charge (OMS1) was a man in his 40s. Having been born and raised near A City, he was accustomed to life with snow. He had worked for many years at a facility where people with congenital blindness also resided. However, the residents of A City lead car-centric lives, and he had no experience conducting training for PVIs during snowy periods. He had assumed families provided transportation. For OMS1, winter walking training was also a first-time experience. Owing to these circumstances, the other OMS colleague (OMS2) accompanied them as an observer.

The informed consent of all the participants were obtained properly. Video cameras used were Sony FDR-AX60 models. Two RODE Wireless Go II wireless microphones, each with a transmitter, were attached to the chests of the PVI and OMS1. Audio receivers were attached to the front camera for recording, and audio input was recorded in stereo mode, left and right. This audio was

synchronized with the rear camera footage for analysis. Additionally, each participant wore an Olympus IC recorder for audio backup. A GoPro action camera was also attached to PVI's chest, but its use was discontinued shortly after training began due to rain.

The training route involved walking to the station one stop beyond the railway station near the university. On the way there, the pair exited the campus through the main gate. On the way back, they retraced part of the route before turning off and re-entering the campus through one of the service gates. Initially, walking with human guide assistance was planned, but at the request of the PVI, it became independent walking.²

The transcript presented in this paper covers the first 3 minutes and 55 seconds of the training session. Line numbers in the excerpts correspond to this transcript. Since excerpt numbers follow the order of presentation, the line numbers may sometimes appear out of sequence. The first line shows the Japanese utterance in Romanized form. The second line shows the gloss, and the third line is the English translation. Lines 4 and beyond indicate embodied actions used in the analysis. When the line does not form a complete sentence, the second line may be omitted. The cane is denoted as "C", while left/right, hand, foot, and umbrella are represented as L/R, H, F, and U. "+" and "*" denote onset of embodied actions by the PVI and the OMS, respectively.

Please note that the analysis in this paper is based primarily on footage from the rear camera because the front camera failed to effectively capture the initial portion of the training session. Consequently, the movements clearly visible in the PVI's footage are limited, and the analysis must also rely on inferences based on sound.

The section discussed here is just under 200 meters in length (Figure 1). Initially, the PVI and OMS1 walked straight along the sidewalk of the main arterial road. The pavement conditions included areas with snowdrifts on both sides, compacted and level sections, exposed sections, and sections not exposed but covered with thin, melting snow (i.e., "trodden paths"). Braille blocks were laid on the sidewalk. Some sections with Braille blocks had been cleared of snow, exposing the blocks, while others remained covered. The PVI and OMS1 then turned left off the sidewalk heading east (Spot ⑤ in Figure 1). At this corner was a patch of untrodden snow. The road beyond the turn had been cleared, but this corner was wide, and only the central portion had been cleared, leaving deep snow elsewhere.

² In this paper, the term "independent walking" refers to persons with visual impairments walking using a cane, in contrast to walking with human guide assistance. Helen Keller National Center provides a guide "Providing human guide assistance" (<https://www.helenkeller.org/resources/human-guide-techniques/>)

3 Sole Sensation and Cane Operation

The sensory input resources PVI's utilize when navigating streets are broadly categorized as tactile and auditory. Tactile input primarily comes through the cane and the soles of the feet. This remains unchanged even when walking on snow-covered paths. Here are two examples illustrating this point.

3-1 Sole Sensation

When walking, people perceive the road surface environment through the soles of their feet. Beyond surface conditions like asphalt and cobblestones, they also sense the direction and angle of slopes. While slope perception also involves touch, balance, and proprioception, we will not discuss these aspects here. PVI's sense the unevenness of Braille blocks on the road by tracing them with their cane or stepping on them with their feet. Here, we present examples showing how the PVI perceives road surface conditions, including snowy conditions, using the cane and the soles of his feet.

The PVI walked on the sidewalk of the main road during the first part of the training. The crosswalk just before the sidewalk had no snow accumulation, but there was snow where the sidewalk began (Figure 2). Consequently, he could not feel the Braille blocks. After this section, a stretch of the sidewalk center had no snow. Braille blocks were installed on this sidewalk, but some sections were exposed while others were covered with snow (Figure 3). While walking on the sections with exposed Braille blocks, the PVI verbally expressed this information as self-talk (line 34, not shown here).



Figure 2

- 53 OMS1: Δe::to:: *ro [shutsu ga shitenain desu ne:
 well exposure P do-not CP P
 Well, they are not exposed, you know.
- 54 PVI: [are?
 What?
 Δalarm for train crossing -> line 144
 oms1 -> *steps on exposed part -> line 67
- 55 desu ne.
 CP P
 It is, yes.

We will discuss three points regarding this section. First, the PVI perceives the snowy road surface condition through the soles of his feet and the cane. He reports the presence of snow on the road surface and his inability to feel the Braille blocks, asking OMS1 for confirmation. Second, repair is achieved. The formulation, “Braille blocks are absent,” is inaccurate; OMS1 presents the formulation, “The Braille blocks are not exposed.” Third, this sequence is initiated by the PVI. In instructional activities like walking training sessions, sequences are often initiated by OMSs. PVIIs initiate the sequence by reporting their observations.

First, the PVI reports his findings: “Well, there is snow here, and already the situation is that the Braille blocks are no longer existing, you know?” (lines 51–52). A locative deictic expression, “*koko*” (here), and the expression, “*moo*” (already), combine to form a contrast with the previous surface condition.

The two matters the PVI reports are constructed to be heard as being based on his tactile experiences. The contrast created by “here” and “already” also implies him sensing a change from the previous road surface conditions. The “*ne*” (you know?) at the end (line 52) lightly seeks agreement.

Second, in response, OMS1 hesitates slightly before offering a different formulation (i.e., “They are not exposed”) to repair. PVI’s expression, “*nai*,” can be heard as “does not exist.” However, the Braille blocks are laid on the sidewalk. They are simply not exposed on the surface because snow has accumulated. The PVI accepts this repaired formulation as a matter of course (“It is, yes,” line 55). He seems to treat OMS1’s formulation as precisely what he intended to say initially. However, before that, the railroad crossing alarm began sounding, prompting him to express noticing, “*are*” (what?) (line 54).

Third, the PVI initiates a sequence here. Sequences initiated by the instructor are frequently observed in instructional interactions. By spontaneously presenting observations about the situation and seeking confirmation, the PVI can demonstrate that skill and assert his agency. In a sense, he is exposing his own behavior for evaluation. Through this sequence, the PVI's performance is confirmed to be acceptable. Training is set to continue.

Note the sensory resources assumed in the above exchange. The PVI cannot feel the Braille blocks. When the blocks are exposed, they are felt by the cane and the soles of the feet. Where the sidewalk surface is covered with snow and the Braille blocks are not exposed, they cannot be felt. They are "not there." Conversely, the snow covering the road surface is being felt.

3 – 2 Cane Operation

Next, we examine the scene where the PVI's cane became stuck in the snow and could not be pulled out. This serves as evidence that the PVI was using the cane to detect the road surface and snow walls. Furthermore, as a lesson learned from this incident, both the PVI and OMS1 agreed that operating the cane requires ingenuity and practice during snowy conditions.

After Excerpt 1, the PVI and OMS1 continue walking along the sidewalk. The snow on the sidewalk grows deeper, and the walls flanking the trodden path gradually rise higher. They steadily approach the railroad crossing where the alarm is sounding. The opening of Excerpt 2 shows this scene (took place at Spot ③ in Figure 1). The utterance, "We will not cross the railroad tracks" (line 88) repairs and repeats what was conveyed just before. The two proceed leftward without crossing the railroad tracks.

Excerpt 2

88 OMS1: **senro** [wa matagimasen.
 railroad-track P cross-not
 We will not cross the railroad tracks.

89 PVI: [kono yuki ga
 This snow is

90 +kono khh +koko ga hora* #tsuku to
 this here P see stick and
 This, here, see, when I stick the cane into the snow,
 pvi +C gets stuck in snow
 +stops walking - > line 93
 oms1 *stops walking ->line 95
 fig #6

100 **so so kenkyuu nandesu yo.**
 correct correct study CP P

Yes, yes. It truly requires a study.

101 **OMS1: kenkyuu [desu ne:**
 study CP P

You need to study it.

The cane gets stuck in the snow on the left and cannot be pulled out (Figure 6). The PVI describes and reports the situation (lines 90–91). He stops. The utterance presents his reason for doing so. He uses *ko*-series deictic expressions to make a reference, drawing the OMS1's attention before stating the outcome: "gets caught." The PVI reports based on tactile input from the cane operation, while OMS1 perceives this visually.

After OMS1's acknowledgment (line 92), the PVI kicks the cane out of the snow with his left foot. Figure 7 shows the moment the left foot strikes the cane. The utterance made with this motion (line 93) is not clearly audible, but it can be heard as identifying this incident as a difficult case of walking on snow. OMS1 responds with laughter, which can be heard as "troubles resistance" (Jefferson 1984) and as acknowledging the appropriateness of kicking the cane out as a solution to the trouble (line 95).

The PVI, having started walking again, begins investigating why the cane got stuck in the snow (line 94). The way he holds the cane is suggested as a possible cause ("Maybe the problem is how I'm holding it," line 96). The reference using the deictic expression "*ko*" ([I]ike this) (line 96) also draws OMS1's attention to the cane's movement (Mondada 2014; Bouaouina et al. 2025; Nisisawa & Sakaida 2025). However, in terms of its construction, the turn is not addressed to OMS1 but constructed as self-talk. It sounds like verbalizing the act of trying various ways to tap the cane against the snow wall (line 99).

In response, OMS1 utters, "This definitely requires a study, doesn't it?" (line 98). While translated as such, this "study" (*kenkyuu*) may also represent a formulation of what the PVI is doing. It posits that the cane operation the PVI is practicing at this point constitutes a "study" practice. In any case, what both parties agree on here is that there is an appropriate way to apply the cane to snow walls, which the PVI has not yet mastered. It needs to be discovered and learned. The term "study" is a formulation emphasizing the process of discovery. The sequence starting with OMS1's utterance on line 98 is agreed upon by the PVI using the word "study" and reconfirmed by OMS1. The task of discovering the appropriate cane technique for snow wall detection was thus identified

and agreed upon.

A problem occurred when the cane became stuck in the snowbank and could no longer be operated. After the issue was resolved by kicking it free, a discussion ensued to determine the cause of the problem. This is particularly appropriate for the activity at hand: walking training. This problem hinders walking and should thus be avoided in the future. Research (“study”) into the proper way to hold and operate the cane as a countermeasure was proposed and agreed upon. The PVI’s investigation and OMSI’s formulation of “study” reflect their orientation toward engaging in instructional activities.

Observe that the PVI was detecting snow walls with the cane. Typically, PVIs use their cane to detect not only obstacles on the road and Braille blocks but also curbs and walls. They often touch curbs and walls periodically, using these as guides to follow. On snowy paths, they walk along trodden paths, but to locate these paths, they probe the snow walls with their cane. It was during this operation that the cane became caught in the snow wall.

Here, we see examples of the difficulties encountered when walking on snow-covered roads and the discussions of countermeasures. Properly detecting a snow wall as a guide using a cane requires specific techniques. Both parties agree that discovering this fact and identifying the specific cane techniques can be achieved through “study” (*kenkyuu*). Excerpt 2 shows that OMSI views this challenge as solvable by the PVI, and the PVI agrees with this.

This section first examined a case where the PVI provided a formulation about the snow conditions on the road surface, which was then repaired by OMSI. We then treated a case where a cane became stuck in a snowbank and could no longer be operated. In the two cases, the PVI employed the same tactile utilization with his cane and the soles of his feet as he does in snow-free conditions. However, the PVI and OMSI found that its forms differed slightly due to the snow.

4 “A Width Passable by a Person”

OMSI used the formulation “a width passable by a person” at the beginning of the training.³ Although it was uttered as the subject of a sentence, the PVI immediately understood this formulation and responded before the predicate was provided. His understanding was displayed alongside pointing to a specific example of the road surface condition expressed by this formulation. In a sense, a demonstration of understanding was achieved (Sacks 1992; Minami et al. 2023). That is, the fundamental principle of walking on snowy roads—finding and walking along “a width passable by a person” on the road—was understood and established. This section examines this exchange.

³ The original Japanese is “*hito ga tooreru haba*,” which literally translates as “[a] width in which [a] person can travel.” Note that Japanese does not distinguish between singular and plural nouns.

The initiation of a sequence through information provision by OMSs constitutes the fundamental organization of instructional training sessions. In the following excerpts, the PVI is observed to understand the verbal information of OMS1 based on experiences derived from tactile inputs.

4 – 1 Sensing Trodden Paths with Cane and Soles of Feet

Figure 8 illustrates the expression “a width passable by a person” discussed in this section. A trail is visible within snowdrifts exceeding 30 centimeters on both sides. This is the area between the snow walls where the ground is lower. Many people have walked here, compacting the snow and making it lower than the surrounding area.



Figure 8 Trodden Path

The formulation “a width passable by a person” targeted in this section is based on relative height. The PVI walks through an environment where this formulation applies by the time this utterance is made. Figure 9 shows this path (Spot ① in Figure 1). As seen in Figures 10-13, the trodden path appears in areas where the pavement surface is not exposed. The PVI uses the cane and the soles of his feet to locate the path and walk on it. He changes direction three times: left, right, left. This action is accomplished independently, without any verbal information provided by OMS1.

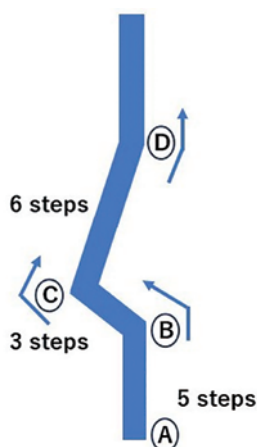


Figure 9 Map of First Part

First, using Figure 9, we describe the PVI's walking from the point of completing the crosswalk to the exposed portion of the sidewalk. Figure 10 shows the moment after crossing, when the PVI's right foot reaches the snow at the edge of the sidewalk section. This corresponds to Point ① in Figure 9. From here, the PVI walks straight ahead for five steps (Point ②). On the sixth step, he changes direction to the left (Figure 11). Next, the left foot lands on the third step, slides, and rotates to change direction to the right (Point ③, Figure 12). After this, the next step with the left foot appears to be a sliding step, moving forward while making contact with the low snow wall on the left side. Then, at what appears to be the sixth step, the PVI turns slightly left (Point ④, Figure 13). Although the PVI's feet are not visible, his upper body is clearly facing the direction of travel on the road.



Figure 10 Point ①



Figure 11 Point ②



Figure 12 Point ③



Figure 13 Point ④

The fact that the PVI walks so precisely along the trodden path with slight directional changes rather than a straight line serves as evidence that he effectively utilizes the sensations from the cane and the soles of his feet. This is the result of his ability to perceive the position of snow walls and the compacted road surface.

OMSI's utterance is made during this sequence of movements. The opening of the utterance is the formulation "a width passable by a person," which is immediately understood and accepted by the PVI. It can be presumed that this is precisely because it matches the sensory experience he had just undergone.

Excerpt 3

- 01 **PVI:** °hana kaii.° (0.8) °ga shikashi:°
 nose itchy but however
 My nose is itchy. But, however,
- 02 °tenji burokku ga aru +#ka to iwareru to°
 Braille blocks P exist P that say-PT then
 When asked whether there are Braille blocks,
 pvi +stops on snow
 fig #10
- 03 +°tenji burokku wa nai.°
 Braille blocks P not-exist.
 there is no Braille block.
 pvi +turns L
- 04 **OMS1:** kantan#ni jookyoo dake o-tsutaeshimasu +#to:
 simply situation just honorific-tell then
 Let me tell you the situation briefly,
 pvi +turns R & LF slips
 fig #12
- 05 **PVI:** +hai=
 Yes.
 pvi +LF slides along treaded part
- 06 **OMS1:** =ichi#oo: e::: hito ga tooreru haba=
 more-or-less well person P can-pass width
 to a width passable by a person
 fig #14



14

- 07 PVI: **hai. +koko desu yo** [**+#ne.**
 yes here CP P P
 Yes, here it is, correct?
- 08 OMS1: [**ee.**
 Yes.
 pvi +C swing starts
 +turns L
 fig #13
- 09 OMS1: **no josetsu wa** [**dekitemasu.**]
 P snow-removal P can-do
 of which the snow has been cleared.
- 10 PVI: [**°yoshi.°**] **hai.=**
 Good. Yes.

Upon hearing “a width passable by a person,” the PVI uses a deictic expression to indicate “here” as the section he is walking on while seeking confirmation (line 07). It is possible that the cane is swung to the right in sync with the utterance “here,” pointing by touching the wall marking the boundary between the lower snow section on the sidewalk and the higher snow sections on either side. Unfortunately, the video camera footage does not allow confirmation of this. In any case, OMS1 observes that the PVI is effortlessly perceiving the trodden path, presumably through tactile sensation mediated by the soles of their feet, the cane, and the umbrella.

Figure 14 shows the scene immediately after OMS1 begins speaking on line 06. OMS1 is positioned slightly behind and to the right of the PVI. Directly ahead, a cleared sidewalk section without snow is visible. The PVI is standing on an area compacted by pedestrians, which can be understood as the portion formulated by the expression “a width passable by a person.”

OMS1 utters an acknowledgment token on line 08 and then utters, “of which snow has been cleared.” The Japanese particle “*no*” grammatically indicates that the predicate is centered on “a

width passable by a person.” The response “yes” from the PVI sounds like a mere formality, lacking genuine agreement. This mystery is resolved by observing the subsequent developments.

4 – 2 Whether or Not the Road Surface is Exposed

The “situation” description by OMS1 likewise continues. This ongoing utterance segment sounds as if it were planned from the beginning of line 06. It does not sound, at least, as if it were triggered by the fact that the PVI’s utterance on line 10 sounds like it lacks agreement. OMS1 distinguishes two states on the road surface: “areas where the asphalt pavement is exposed and areas where it is not” (lines 11–12). The PVI is presumed to have reached the exposed section by the time OMS1 begins the utterance on line 12. Figure 15 shows the image immediately preceding this moment.

Excerpt 4

11 OMS1: =**tadashi ro#men ni wa (.) e: +asufaruto romen no:**
 however road-surface P P well asphalt road-surface P
 However, the road surface has areas where the asphalt pavement

fig #15

12 **+roshutshu shiteiru bubun to shitenai bubun ga arimasu.**
 exposed do part and do-not part P exist
 is exposed and areas where it is not.

pvi +RF presumed steps on exposed asphalt

13 PVI: **+aa# >hai hai hai.<**
 Oh, yes, yes, yes.

pvi +3rd step on exposed part
 #3



15 3 (reprint)

14 OMS1: (.) **hai.**
 Yes.

15 PVI: **okkee de:su.**
 I understand.

This additional situation description of the OMS1 is received with strong agreement by the PVI, as indicated by three *aa*-prefaced repetitions of “yes” (line 13, Figure 3). “[W]ith an *aa*-prefaced response, speakers display a change of state but simultaneously show that they have previous knowledge of some parts of the informing” (Endo 2018). When the PVI utters, “*aa*,” he has taken the third step while walking on the exposed section. The utterance on line 13 asserts agreement with OMS1’s statement (lines 11–12)— “the road surface has areas where the asphalt pavement is exposed and areas where it is not” —after transitioning from the unexposed to the exposed section and sensing this. OMS1 accepts this response with satisfaction (line 14), and the PVI also displays confirmation.

In other words, the PVI’s demonstration of understanding, “Yes, here it is, correct?” (line 07 in Excerpt 3), only addresses the initial portion of the situation description OMS1 had intended. The situation description of OMS1 concerns the entire sidewalk they are about to walk on, not just the spoken section. Nevertheless, the formulation “a width passable by a person” is spot-on as a description of the pavement surface the PVI is experiencing. Moreover, this understanding is gained through the same cane and foot-to-ground sensations that the PVI utilizes when walking in snow-free conditions.

4 – 3 Utilizing Auditory Input

We discussed the use of touch in the above examples. What about auditory inputs? PVIs sometimes use the sound of cars traveling parallel to them as a cue to determine their direction of travel (Saerberg 2010; Shibata 2015). In this study, the PVI possesses this skill to a high degree. OMS1 is aware of this and subsequently tells him to utilize it (line 16 in Excerpt 5). It is apparent that OMS1 assumes that the sound of cars is as usable as it is in snow-free conditions.

Excerpt 5

16 OMS1: **migi gawa no shaon o #tegakari ni**
 right side P car-sound P clue P
 Use the sound of the car on your right as a guide

fig

#16



16

- 17 **shinkoo hookoo o ijishite kudasai.**
 travel direction P maintain please
 maintain your direction of travel, please.
- 18 **PVI: hai.**
 Yes.

The right side of the sidewalk where the PVI and OMS1 are walking is a major arterial road, with cars driving along it fairly frequently. During the utterance by OMS1 on line 14, a wagon passes in the same direction. Then, during the utterance on line 16 (Figure 16), a truck approaches in the opposite lane. The vehicle sounds serve as a basis for determining the direction of travel.

One possible reason for recommending the use of vehicle sounds here is the fact that they are walking alongside busy arterial roads. A passive reason is the inability to use the walls along the sidewalks. On the left side is the university campus, which has a tiled wall marking the boundary (Figure 16). There is about 30 centimeters of snow in front of this wall, hindering its use as a guide by tapping with a cane to determine the direction of travel. This point will be discussed later in Section 5-1 of this paper.

OMS1's utterance (lines 16–17) can be heard as a reminder that while the PVI will find out through touch and walk on the areas where the pavement is exposed or where the snow is more compacted than the surrounding areas, vehicle sounds can also be used to roughly determine your direction of travel. In areas with vehicle traffic, these sounds serve as a general guideline.

This section presented fragments demonstrating that sensory inputs utilized during walking on snow-free surfaces—specifically, touch via the cane and soles of the feet and the use of vehicle sounds—are also employed on snow-covered paths. Regarding cane use, it was concluded that “study” (*kenkyuu*) is needed on touching snow walls. Overall, OMS1 observed that the same sensory inputs used on snow-free surfaces are utilized.

5 Unable to Use Walls as Guides

This section and the next focus on scenes where a turn to the left is made from the initial straight path (Spots ④ and ⑤ in Figure 1). In Section 1, it has been argued that navigation consists of choosing “which road” and “which part of the road” to take. Turning onto a road relates to the issue of “which road.” When moving from location A to location B, it is possible to use only one road, but typically, one travels along several roads. This involves passing through junctions where one road turns into the next. For PVIs, detecting these junctions is critically important. While the same is true

for sighted pedestrians, this issue is particularly acute in the context of driving.

When a road borders a large property in urban Japan, there is often a boundary wall between the road and the property, and breaks in the wall usually mark a corner. In the first part of this day's training, the PVI and OMS1 are walking along the university campus. There is a wall at the boundary with the road, and where it breaks, there is presumed to be an intersection with another road. In other words, the wall serves as a marker for turning a corner.

When walking on roads without sidewalks, curbs mark the boundary with the land outside the road, serving as a guide. PVIs tap their canes rhythmically against the curb to determine their direction of travel. In Japanese, this motion is expressed using the verb "*tsutau*." Phrases like "*enseki* (curb) *o tsutau*" or "*kabe* (wall) *o tsutau*" are used, implying the behavior of periodically touching the curb or wall with a cane to use it as a guide.

In the sequences discussed here, OMS1 states that "*kabe* (wall) *o tsutau*" is not possible. This is the bad news that a standard practice cannot be used. The PVI then asks for the reason, but OMS1 does not verbally provide one. The PVI presents a possible answer himself and confirms it by touch. For simplicity, we treat "*tsutau*" as meaning "to use."

5 – 1 Standard Practice is Useless

The pair walks south along the sidewalk of the main road. The PVI knows they are approaching a railroad crossing from its warning sound and the sound of a train passing. He also knows they will proceed east along the tracks. OMS1 informed him a little earlier that the route ahead involves turning left just before the crossing. Excerpt 6 begins as the PVI advances, searching for where to make the left turn.

The PVI knows that the left side is the university campus, which has a tiled concrete wall marking the boundary with the sidewalk. He has already tapped it several times with the umbrella in his left hand to confirm. Incidentally, the PVI and OMS1 are carrying umbrellas because there is a possibility of rain during this training session. It starts to rain lightly at one point, but ultimately, the PVI does not use the umbrella during the training session. He uses it sometimes as a walking stick for balance when walking in deep snow and to confirm the presence of the wall. In Excerpt 6 which takes place at Spot ④ in Figure 1, on line 108, after first swinging the cane right to the left and tapping it against the wall, the PVI then taps the wall with the umbrella held in his left hand. He appears to tap the wall with the umbrella as if to reconfirm its presence, after first asking himself, "Is there still a wall?" and confirming its existence with the cane (Figure 17).

As if prompted by the PVI tapping the wall, OMS1 states that the standard practice for walking (i.e., using the wall as a guide) cannot be employed: "When, in case, you choose to use the wall as a

guide, a slight difficulty arises” (lines 111–112).⁴ The expression “a slight difficulty arises” does not literally state impossibility. Its literal meaning is that it is possible but difficult. OMS1 self-repairs this, clearly stating, “You cannot use it.” It specifies the “difficulty.” The PVI overlaps with this utterance to ask the reason (line 114).

Excerpt 6

108 PVI: **de kono hen mada kabe?+ hai# ka+be.**

and this area still wall yes wall

And around here is there still a wall? Yes, there is a wall.

pvi +C tap on wall 1 time

+U tap on wall 1 time

fig #17



17

109 OMS1: **hai.**

Yes.

110 PVI: [**kabe:**

wall

111 OMS1: [**(doozo) moshi are deshitara: kabe o tsutai nagara:**

?please if that CP-then wall P use while

when, in case, you choose to use the wall as a guide

112 **tte yuu no wa chotto +konnai ga shoojimasu.**

that P P P slight difficulty P arise

a slight difficulty arises.

pvi +U tap on wall

113 **e [:: tsutai kire masen.**

well use can not

4 The orientation and mobility specialist in charge uses the expression “*kabe o tsutau*.” The verb “*tsutau*” here means moving while touching the wall to use it as a guide. However, there is no single word or compound verb in English that can express this motion. Therefore, for simplicity, the English expression “using the wall” is substituted.

- Well, you cannot.
- 114 PVI: [**>nande<**
Why not?
- 115 (2.0)
- 116 PVI: [**kabe nakutemo daijoobu desu ka ne:**
wall without all-right CP P P
Is it all right without a wall?
- 117 OMS1: [**e:: ma hinto to shite wa:**
well say hint P as P
Well, as a hint,
- 118 PVI: **hai.**
Yes.
- 119 OMS1: **e:::: +romen no >roshutsu ga detekimasu [node:<**
well surface P exposure P emerge since
well, the road surface will become exposed, so,
- 120 PVI: [**a: hai.**
Oh, yes.
pvi +stops walking
- 121 OMS1: **soko wa hitotsu hidari ni ma[garu**
there P one left P turn
that is one (clue) to turn to the left



There is no response from OMS1 to this query from the PVI (line 115). Overlap is suspected to be the cause. Consequently, the PVI expresses anxiety about whether he can find out where to turn (line 116). This can be heard as presenting the reason for asking “why” and urging an answer. Overlapping this, OMS1 starts providing a fact that serves as a clue for knowing where to turn (line 117). The exposed road surface serves as that clue (lines 119 and 121). Without directly answering the PVI’s question, this response addresses the concern behind the inquiry (line 116).

It is somewhat noteworthy that the term “hint” is used here. “Clue” (*tegakari*) would seem to be the more common expression. In Japan, “hint” is a word frequently used in quizzes. This choice of word can be heard as respecting the PVI’s autonomy. While it must be limited to pointing out possibilities, it is an intriguing usage. Ultimately, subsequent developments show that the PVI did not follow what is presented as a “hint.”

5 – 2 Discovering and Accepting Reason

The PVI initiates a repair by reintroducing a question that received no response (lines 122–123). He stops walking at the start of the utterance on line 122 at Spot ⑤ in Figure 1. While OMS1 is hesitating (line 124), he independently presents the strong possible response, “There is snow?” (line 125).

Excerpt 7

- 121 OMS1: **soko wa hitotsu hidari ni ma[garu**
 there P one left P turn
 that is one (clue) to turn to the left
- 122 PVI: [+kore, nande
 This, why
 pvi +stops walking
- 123 **kabe ga tsutae rare naindesu ka +#ima**
 wall P cling can not P now
 why cannot I cling to the wall now?
 pvi +C on snow on L
 #18
- 124 OMS1: ***e:to desu +ne:#**
 well, say, you know,
 oms1 *steps into snow and stands to PVI's L
 pvi +U tap on snow
 #19
- 

- 125 PVI: **yu+ki +#ga aru?+#**
 snow P exist
 There is snow?
 pvi +LF small step to L
 +C on snow

+C hits wall




fig #20 #21

126 OMS: >soo [desu.<
Exactly.

127 PVI: [+#a yuki ga aru.
oh snow P exist
Oh, there is snow.

pvi +U tap on snow by wall

fig #22

128 OMS1: >soo desu.<
exactly
Exactly.

Figure 18 shows that at the start of this repeated inquiry, the tip of the PVI's cane is placed on the top of the snow wall to the left. Then, at the very end when OMS1 hesitates in his response, the tip of the umbrella is placed on the snow to the left (Figure 19). A distinct “crunch” sound is clearly recorded. Through the cane and umbrella, the PVI likely knows that immediately to his left stands untrampled snow approximately 20–30 centimeters high.

The rising intonation at the end of line 125 (“Is there snow?”) suggests the PVI is presenting it as a possibility. Simultaneously, the cane touches the snow (Figure 18) and moves upward, striking the wall (Figure 21). This clearly conveys snow extends right up to the wall's edge. Furthermore, the PVI touches the snow immediately below the wall's edge with the umbrella (Figure 22). Simultaneously, he loudly utters an *a*-prefaced statement, which is a change-of-state token (Heritage 1984; Endo 2018), asserting a significant realization (line 127). Specifically, although the PVI is aware of the depression in the center of the sidewalk flanked by snow walls, he had not known that the snow accumulation extended all the way to the left wall. The prevailing interpretation is that this discovery occurred at this moment. Consequently, OMS1's statement that it was impossible to use the wall became comprehensible.

This section examined the situation immediately before the PVI and OMSI turned left. OMSI's assertion that the wall could not be used as a guide was understood and agreed with when the PVI, using a cane and an umbrella, discovered snow accumulation along the wall on the sidewalk. This led to the adoption of an alternative practice: using the snow wall as a guide.

6 Walking on Snow and a Learned Lesson

Finally, we deal with the section where the PVI walks through deep snow (Spot ⑤ in Figure 1). Up until then, the PVI had walked where he should have. While some areas are covered in snow, it is packed snow. He does not sink deeply while walking. However, at this first left turn, he ignores OMSI's "hint" and crosses the snow wall immediately after the physical barrier ended and turns left. As a result, he walks ankle-deep in snow. This is an issue of navigation concerning "which part of the road" to take. The PVI crosses the snow wall and walks where there is no trodden path, experiencing firsthand the difficulty of that walk. He then declares the adoption of the practice of using the snow wall as a guide and walking the trodden path.

Unpacked snow is piled up along both sides of the road after the left turn. As shown in Figure 23, the road has no sidewalk. It is approximately 4 meters wide and one-way. The central 2 meters have been plowed, exposing the asphalt. As vehicle traffic is light, pedestrians can also walk on this exposed part.



Figure 23 Road after Left Turn

At this corner, PVI turns left quite sharply, resulting in a prolonged walk through deep snow. This outcome stems from his use of the end of the physical wall as a landmark—a standard practice usually effective in snow-free conditions. From this experience, the PVI learns the lesson that such decisions ultimately lead to getting lost. This section will describe these events in a highly focused and selective manner.

6 – 1 Crossing the Snow Wall

The PVI discovers snow accumulation up to the wall, and OMSI confirms this as the reason the wall

cannot be used as a guide (line 128 of Excerpt 7). Subsequently, OMS1 presents three formulations for this location: “the wall ends” (line 129), “the corner” (line 133), and “the corner where we turn left” (line 135). PVI asserts understanding of the first formulation, “the wall ends” (line 130), and demonstrates it. He swings his cane forward, striking the metal railing atop the wall (line 131). Immediately before this movement, he takes two steps forward (line 130), though it appears he has already accurately determined the break point of the wall beforehand. The movement of swinging the cane in an arc from the wall-less south side to strike the fence on top of the wall serves as evidence of this.

“[T]he corner where we turn left” (line 135) is a repair of “the wall ends” (line 129) in terms of content. The formulation “the wall ends” carries little navigational implication. The formulation “the corner where we turn left” clarifies this. Interposed between them is the formulation “the corner” (line 133), which may be a repair of the PVI’s mispronunciation of “wall” (line 131). This English word pronounced in the Japanese way “koonaa” is replaced on line 135 with the native Japanese term “*kado*.”

Excerpt 8

- 129 OMS1: **de koko de kabe owari nan**[**desu kedo**:
and here P wall end CP but
And here the wall ends, but,
- 130 PVI: [**+>wakarimashita.<**
I understand.
pvi +small 2 steps forward
- 131 **koko ga ka+ze desu ne.** [**hora+**
here P (corner) CP P see
Here is the corner, see?
- 132 OMS1: [**soo desu ne.**
You are right.
pvi +swings C from R & hits steel fence
+C hits concrete wall
- 133 **koko ga koonaa.**
Here is the corner.
- 134 PVI: [**hokkee.**
I see.

135 OMS1: [e: hidari ni magaru [kado ni narimasu.
 well left P turn corner P become
 Well, this is the corner where we turn left.

136 PVI: [okkee.
 I see.

137 Δja maga+ro#o.
 then turn
 Then I turn now.
 Δtrain passes crossing ->line 141

pvi +LF in snow
 fig #24

138 OMS1: hai.+#
 Yes.

pvi +RF in deep snow
 fig #25



24



25

139 PVI: [#are+#::
 Oh my!

140 OMS1: [a: socchi ikimasu ka:*+#ahh
 oh that-way go P
 Oh, you are going that way, aren't you?

pvi +LF in deep snow -> line 149
 oms *moves & stands back of PVI
 pvi +RF next to LF
 fig #26 #27 #28



26



27



28

On line 136, the PVI receives and acknowledges OMS1's utterance, "Well, this is the corner

where we turn left” (line 135). Then, as if responding to it, the PVI says, “Then I turn now” (line 137) while stepping left with his left foot (Figure 24). The left foot lands near the edge of the compacted area; the front half of the foot may have sunk slightly, but it does not appear to be deeply embedded. The right foot is then lowered at the end of the OMS1’s “Yes” on line 138 (Figure 25). Here, it appears to sink at least 10 centimeters. The PVI steps in, shifts his weight onto the right foot, and prepares to step out with the left foot next (Figure 26). However, during this sinking motion, he utters a surprise marker, “*are*” (line 139).

From the moment this right foot appears to land on the snow surface until the left foot lifts off, we count 13 frames in QuickTime (Figures 25–26). At 60 frames per second, this amounts to roughly 0.2 seconds. The next left foot also sinks quite deeply in the same manner (Figure 27), up to the ankle bone. It likely sinks about 20 centimeters. Then, to regain balance, the next right foot is placed beside the left foot. Figure 28 shows the PVI standing upright, using the umbrella as a walking stick.

As the expression of surprise displays, the PVI clearly did not anticipate such deep snow. OMS1 had suggested, as a “hint,” that they should reach the point where the road surface is exposed and then turn (lines 117, 119, and 121). The PVI’s utterance occurs while repairing and repeating a question asking why he is “unable to use” the wall, which OMS1 could not hear clearly. Regardless of the circumstances, the PVI ended up walking through deep snow, which means walking on snow. This was the consequence of making a line selection of crossing the snow wall.

6 – 2 Walking Through Deep Snow on His Own

Here, we discuss how the PVI walks independently across untrampled, unmarked snow. The snow is deeper than he anticipated. However, he issues a statement declining OMS1’s assistance and traverses this section on his own. Having been heading east, he changes course to the right, toward the south, and emerges onto an exposed section of road. This is likely achieved by utilizing the cognitive map he possesses, his knowledge of having traveled south up to that point, and auditory information, such as the sound of railroad crossing bells, train traffic noise, and OMS1’s voice. As the PVI approaches the end, the depth of sinking decreases, and it appears he also uses this sensation as a resource.

The PVI expresses surprise again at the unexpected snow depth, uttering, “Oh my!” (line 141). However, he requests OMS1 to “Hold on a sec,” asking OMS1 to not come to help. It is a declaration that he can manage on his own, that he can do it. The expression “hold on a sec” is often uttered during retries or reattempts after failing behavior. OMS1, as seen in Figures 27 and 28, moves directly behind the PVI while the PVI walks through the deep snow. He stands at the edge of the packed-down area, a position from which he can rush to rescue if needed. “Hold on a sec” serves to

hold back this rescue readiness posture. It is an expression of the PVI's orientation to resolve the predicament independently.

After Figure 28, the PVI takes two small steps left and right, changing his direction from east to slightly south (Figure 29). Note that the snow remains deep, causing the PVI's steps to sink further, though this is not mentioned here. After uttering, "It's strange" and "Hold on a sec" again, the PVI says, "But I am all right" (lines 141 and 143). This could be interpreted as self-reassurance or addressed to OMS1. OMS1 responds with "Hmm" (line 144). At the point shown in Figure 29, OMS1 has taken one step onto the unpacked snow. After this, he brings his left foot up to meet the right and stands upright in this spot.

Excerpt 9

141 PVI: are: Δ>chotto matte na< kore ka+#be [okashiina:
 wow a-little wait P this wall funny
 Oh my! Hold on a sec! This is the wall. It's strange.

142 OMS1: [hai.
 Yes.

-> Δtrain goes by

pvi +RF on snow
 fig #29

143 PVI: chotto matte yo. demo daijoo+#bu.=
 a-little wait P but fine
 Hold on a sec. But I am all right.

pvi +RF on snow
 fig #30



29



30

144 OMS1: =*n.
 Hmm.

oms1 *turns R & starts walking->line 148

145 PVI: mu +mushishite [arukoo.Δ#
 disregard walk

Let me just walk on by.

146 OMS1: [ok+kee desu.

You are fine.

pvi +turns to R

-> Δcrossing alarm stop

pvi +turn to further right

fig #31



Figure 30 shows the PVI taking two large steps forward, first with his left foot and then his right. His stride is long, and his direction changes further to the right, toward the south.

At the point shown in Figure 31, the PVI is oriented nearly perpendicular to the cleared road surface. Three factors likely guided the directional change of the PVI up to this point. Two of these are the level crossing warning sound and the sound of the train passing. The warning signal had been sounding continuously well before this section (starting on line 54). After the westbound train passed, the eastbound train then passed on lines 138–143. While the alarm sound source is fixed, the train sound moves. The PVI knows that the tracks run east to west. This knowledge is sufficient as a resource to implement the movement required to escape the snow: head south.

OMS1 begins walking toward the exposed section of the road on line 144 after the PVI faces south on line 143. This indicates the rescue preparation posture has been released. At the time line 140 is uttered, OMS1 is immediately behind the point where the PVI begins turning left. The PVI also knows that he is facing east and that OMS1's voice is coming from behind him, which is west, and uses this as a resource for determining his own direction.

6 – 3 Using Snow Walls as Guides

Excerpt 10 shows the point where the PVI exits the deep snow section onto the exposed asphalt after changing direction. From turning left and stepping into the deep snow until exiting it, OMS1's involvement is minimal. The PVI's utterances resemble self-talk, and even the two "hold on a sec" utterances reject OMS1's involvement.

In Excerpts 9 and 10, the PVI appears to consider two guidelines. One is the physical wall

forming the roadside boundary. While explicitly mentioned on line 141, it is treated as something to be ignored on line 145 without being explicitly stated. However, line 145 is uttered at the juncture where the direction changes from heading east parallel to the wall to heading south. The declaration to “disregard” the road wall is made. OMS1 explicitly responds to this declaration with “You are fine” (line 145), thereby acknowledging it.

The “this” in Excerpt 10 (line 148) can also be heard as a deictic expression referring to the road wall. “Try to follow the route” is juxtaposed with “care this.” The argument is that the consequence is “to get lost.” This is the basis for the claim to “disregard.”

Excerpt 10

147 PVI: **kocchi arui#chao.**

this-way walk

I will walk this way.

#32

148 *Δso **kore o kinishite: michi doori ikoo to**

correct this P mind route along go that

Well, if I care this and try to follow the route,

oms1 *turns back to PVI

Δcars start moving seen

149 **omou+*#to:**

think

pvi ->+RF on packed snow, C put straight & starts swing to L

oms1 *stops walking

fig #33



32



33

150 OMS1: n.

Yes.

151 PVI: **mayounda to +omou.**

get-lost that think

I think I'll get lost.

- pvi +reaches exposed area
- 152 OMS1: *soo desu ne* [:
You are right.
- 153 PVI: [+jaa koo yatte #arukoo.
then this-way do walk
Then I will walk this way.
- pvi +turns to L

#34



34

- 154 OMS1: *hai*.
Yes.

Figure 33 shows the moment the PVI reaches the end of the deep snow. Here, he is touching the ground with the cane and senses that the snow has nearly disappeared. Then, he swings the cane to the left. It appears as if he is checking if there are obstacles ahead. It is also suggestive that OMS1 stops at this point. While the PVI may have paused briefly, it seems to serve more as a sign marking the end of the adventure.

After reaching the snow-cleared road, the PVI faces east (i.e., left) along the direction of the road and begins walking. He then declares, “Then I will walk this way” (line 153). It asserts that this is the way to walk without “getting lost.” While speaking “this way” (*koo yatte*), he swings the cane forward and to the left, trying to tap the snow wall (Figure 34). The referent of “this way” appears to be using the snow wall on the road as a guide. OMS1 responds with an acknowledgment token and affirms its appropriateness (line 154).

During the rest of the walk for that day, the PVI frequently uses snow walls as guides. He does not walk along the trodden path as often, even though its position can be determined by the snow wall, which serves an essential component precisely marking “a width passable by a person.” As the PVI declares on line 153, the practice of using snow walls as guides—a standard practice learned from walking on snow-covered trails—can be said to have been acquired through hearing the formulation of “a width passable by a person” and the sensory experience gained from walking on

trodden paths.

7 Walking in Snowy Conditions

When walking on roads after heavy snowfall, pedestrians often find themselves walking on either packed or unpacked snow. Some areas have been cleared of snow by machines or manual labor, while others retain a thin layer. Some snow is packed and does not sink much, while unpacked snow causes you to sink deeply. Sometimes, the snow melts but then refreezes due to the cold night air.

In the data examined in this study, the road surface was never frozen. The PVI was recorded walking on surfaces with no snow at all, surfaces with thin, partially melted snow remaining, surfaces that were unfrozen but hard-packed from being trodden, and areas over 30 centimeters deep that were completely uncompacted. The PVI experienced the first three surface conditions as areas suitable for walking, and the last as unsuitable for walking.

For PVI's, determining where and when to place their next step is a navigation challenge, just as it is for sighted people. In snowy conditions, the depth and quality of the snow at the intended landing point become critical factors. Using a white cane, PVI's must ascertain this information both in advance and by actually stepping and feeling the ground.

OMS1 presented "a width passable by a person" on the sidewalk as the designated course to follow at the start of training. The PVI located this line using the cane and the soles of his feet. When he strayed onto uncompacted areas, OMS1 remained in a position to provide immediate assistance, respecting the PVI's autonomy and independence while maintaining vigilance for safety.

Here, let us share the words of OMS1. These were uttered while they were moving to the starting point of the training, namely, the main gate of the university campus.

As for the walking conditions, I believe it will change over time or with weather changes. Considering your personal walking ability, I'd say there shouldn't be any particular issues. Well, that's the evaluation. Yes. Excellent.

Before this evaluative utterance was made, the PVI and OMS1 had walked for over 10 minutes across the campus from the building housing the PVI's laboratory. The utterance was made just before they reached the main gate, the originally targeted location. The overall assessment of OMS1 is that the PVI walked the course, where he had trained a year earlier, without any issues.

The point to focus on here is the statement, "I believe it (walking conditions) will change over time or with weather changes." Particularly, early morning cold can cause snow on the road surface to freeze. Frozen surfaces are slippery, requiring extra caution (McIlvenny 2019). Snow on the road

shoulders may also increase with further snowfall. General caution regarding these possibilities is emphasized at the start of training.

Changes in walking conditions are not solely determined by the presence or absence of snow. Vehicles may be parked on the road, or other pedestrians may occupy the sidewalk. While adapting to the immediate walking environment is fundamental, familiarization also requires understanding unchanging characteristics such as road geometry and the placement of “street furniture.”

This study confirmed that PVIs utilize skills and knowledge acquired through walking in snow-free conditions when navigating snow-covered terrain. However, these skills and knowledge cannot be applied directly in the same manner. McIlvenny argues:

Learning to walk on snow and to ski means learning to discriminate and feel the dynamic and every changing snow conditions and to adjust accordingly in order to generate movement, flow and rhythm to successfully traverse the surface. (McIlvenny 2019: 147)

Carefully perceive the situation and make the necessary distinctions. Then proceed by modifying your foot placement and cane operation. Walking in the snow includes walking on the snow. Detecting the thickness and condition of the snow you walk upon is crucial.

In the excerpts examined, two sequences originating from information provided by OMS1 and one sequence confirming the perception of the PVI were observed. The former two were discussed in Sections 4 and 5. The other sequence was caused by actions on the part of the PVI. Sections 3 and 6 provided examples of this by illustrating the experiences PVIs face when walking on snow in snowy conditions. The PVI was using multisensorial resources slightly modified from those employed in snow-free conditions, and multimodal interaction analysis proved highly effective in specifying this process. Regarding navigation, it has been demonstrated that line selection—determining which part of the road to travel—is as important as route selection.

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