EMPLOYING ECOLOGICAL KNOWLEDGE DURING FORAGING ACTIVITY: PERCEPTION OF THE LANDFORM AMONG THE GǀUI AND GǁANA

Akira TAKADA
Graduate School of Asian and African Area Studies, Kyoto University

ABSTRACT   The present study focuses on the Gǀui and Gǁana, two neighbouring groups among the San people, who are indigenous to the central region of the Kalahari Desert. In a region of scant rainfall that varies greatly by location and year, the Gǀui/Gǁana developed a vast body of ecological knowledge that allowed them to acquire ample bush foods by moving frequently and flexibly within their immense living area, now encompassed by the Central Kalahari Game Reserve (CKGR). However, since the implementation of Botswana's development program in the 1970s, which encouraged permanent settlement in villages, the lifestyle of the Gǀui/Gǁana has been altered. By 1997, most CKGR residents had moved to a new settlement founded outside the reserve. I examined how the Gǀui/Gǁana applied their environmental knowledge in this new geographical setting. Given the lack of knowledge of landmarks, the scarcity of traditional foods and the promotion of other subsistence activities, their foraging activities appeared to have declined. However, several Gǀui/Gǁana people remained eager to form foraging excursions. These hunters began accumulating knowledge of trees as landmarks, as they had in their previous living area. They also used the trail of Tswana merchants as a frame of reference to ascertain their relative location. The use of the trail is analogous to the Gǀui/Gǁana's use of ǀqāā (a dry valley)—an important landform for wayfinding in their previous living area. The analysis of conversations recorded during foraging excursions indicates that the Gǀui/Gǁana activate their keen sense of the environment through their distinctive use of utterances, gestures, and other signs. This sense is necessary to use both ǀqāā and the Tswana merchant trail as frames of reference in the relatively flat terrain of the Kalahari. Moreover, this sense has motivated the Gǀui/Gǁana to transform a new geographical setting into their personal environment.

Key Words: San; Kalahari; Wayfinding; Perception; Environment.

1. PEOPLE OF THE KALAHARI

The landscape of the Kalahari Desert is more diverse than might be expected from its designation as a desert. Its gentle undulations are shaped by sand dunes, pans (a South African English term referring to wind eroded depressions) and dry valleys (termed *mekgacha* in Setswana), among other features (Thomas & Shaw, 1991). During the rainy season, the arid land becomes green, with colorful flowers blooming on shrubs and trees. A large portion of the vegetation of the Kalahari Desert today is characterised as savannah or steppe. Tanaka (1977) classified the vegetation of the Kalahari as open scrub plain (hereafter, bushveld), *Acacia* woodland (hereafter, woodland), and *Bauhinia* plains. Bushveld is mainly covered by grass species, although trees such as *Grewia*, *Terminalia*,

Lonchocarpus, *Boscia* and *Commiphora* grow sparsely. Bushveld occupies most of the surface of the Kalahari Desert. Woodland is composed of shrubs and trees, including the genera *Acacia* and *Albizia*. Woodland often occurs on sand dune ridges, around pans and on the banks of dry valleys. *Bauhinia* plains are colonized by two species of the low shrub *Bauhinia* (*Bauhinia petersiana* and *Bauhinia esculenta*).

The Kalahari Desert is notable for its lack of permanent and even seasonal watercourses (Thomas & Shaw, 1991: 11). The distribution of surface water, as well as groundwater, is closely related to landforms. For example, dry valleys and pans are thought to be the result of a concentration of groundwater and the subsequent formation of duricrust[1] at or near the Earth's surface (Thomas & Shaw, 1991: 135–140, 157–162). In the rainy season, water basins appear at the center of pans. Annual rainfall is basically scant, but varies greatly with location and year. The mean annual rainfall recorded over 60 years at selected stations surrounding the Central Kalahari Game Reserve (hereafter, CKGR) has varied between 350 and 530 mm. The annual variation in rainfall in the central Kalahari is usually 35% to 40% (Department of Surveys and Mapping 2001: 39).

The absence of stable water sources imposes severe constraints upon people living in the Kalahari Desert. Nevertheless, the G│ui and the G║ana, the people of two neighbouring language groups among the San, have made extensive use of this arid environment. Evidence at many levels (including aspects of kinship, language, rituals, and folk knowledge) indicates a close relationship between the G│ui and G║ana people (Tanaka, 1980; Barnard, 1992; Nakagawa, 1997), although recent social changes have generated considerable economic, political, and identity differences between, as well as within these two groups (Takada, 2002). Notably, their languages are very closely related, both genetically and typologically (Nakagawa, 1997: 34). Because these two groups of people use broadly similar wayfinding practices, they are considered a unit for the purposes of this paper.

The G│ui/G║ana have developed a vast store of ecological knowledge that allows them to locate various edible plants and animals. Moreover, their ecological knowledge permits them to move freely within an immense living area. When examining their mode of spatial cognition and representation, however, we need to consider the pertinent political contexts. During the liberation movement of Namibia, the South African Defence Force (SADF) actively recruited the San people as soldiers, giving them preferential treatment. This was because the South Africans believed that the San, being natural trackers equipped with excellent eyesight and sense of direction, would be effective counterinsurgency operatives. Furthermore, by creating the idea that the indigenous people, and the whites who supported them, were fighting against communist insurgents, the South Africans tried to 'Africanize' the war (Gordon & Douglas, 2000). This colonial scheme has cast a shadow over representations of the San, and has affected their own cultural memory until today (Takada, 2015).

In contrast, the government of Botswana has maintained that any policy that segregates people or defines people according to ethnic groupings would be akin to the apartheid policies of the former South Africa. Accordingly, most of the San within the country have been recognized as Remote Area Dwellers, and have

been targeted by the Remote Area Development Programme (RADP), aimed towards rural development and poverty reduction. However, in reality, the RADP reflects an attempt to assimilate the San into the Tswana-dominated mainstream by introducing the sedentary lifestyle of the Tswana people (Cassidy et al., 2001). This policy was influenced by the folk belief that the nomadic lifestyle of the San, which is viewed as a relic of ancient times, is inferior to settlement. In this context, the national government has encouraged the San to live in the settlement sites allocated by the government.
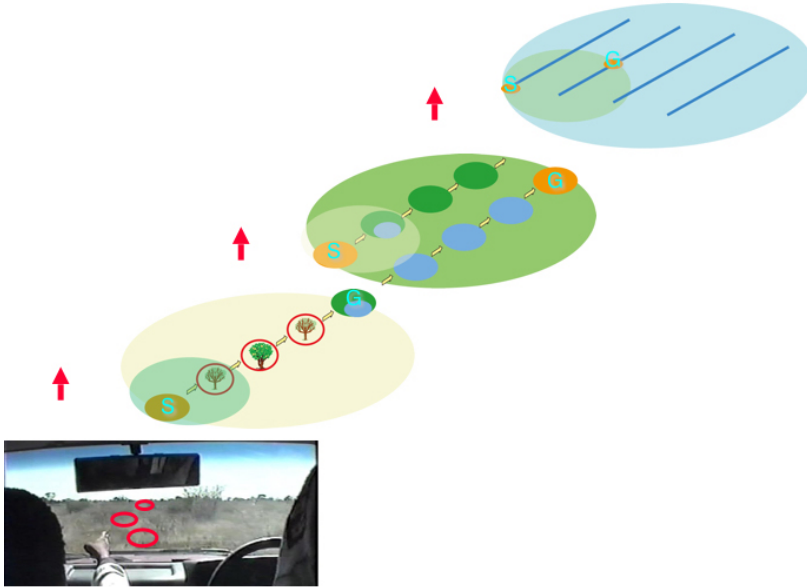
Fig. 1. Mobility strategies of the Gǀui/Gǁana

Whether the San have been stigmatized or neglected, the distinctive political trajectories in which they have been involved make inquiries into their relationship with the environment, an interesting issue that requires careful examination. An approach that may prove promising is to explore how the San themselves perceive the environment by examining their social practices at a specific time and place (Widlok, 1994) as a basis for theorizing the process of constructing meaning. In line with this approach, Widlok (1997) indicated that the Haiǀǀom (a group of San living in north-central Namibia) relied on their experience of walking speed and their memory of places along routes, complementing this knowledge with socially shared knowledge of landscapes that form the Haiǀǀom country. I have also scrutinized the wayfinding practices of the Gǀui/Gǁana based on empirical data collected during my fieldwork. Their multi-scaled moving strategy, which integrates their ecological knowledge, allows the Gǀui/Gǁana to fuse nature and culture, and may be summarized as follows (Fig. 1): (1) An understanding of points with few obstacles on the ground. This strategy is illustrated in the bottom diagram of Fig. 1. The Gǀui/Gǁana quickly find the points with the fewest obstacles (indicated with red circles) when moving through the bushveld; (2) An

immense knowledge of specific trees that are used as landmarks in the bushveld. The second diagram from the bottom in Fig. 1 illustrates this strategy. When the G╎ui/G╎╎ana move from a certain place (indicated as S) towards another place (indicated as G), they often use particular trees as landmarks (indicated with red circles), which usually stand a few kilometers apart from each other between these places; (3) An understanding of woodlands and basins as environmental nodes that provide valuable resources. This strategy is illustrated in the second diagram from the top in Fig. 1. When the G╎ui/G╎╎ana travel long distances (from S to G in the diagram), they transit through nearby woodlands or basins; and (4) A conceptualization of dry valleys composed of sequences of woodlands or basins, which are used as routes for nomadic movement. The top diagram of Fig. 1 illustrates this strategy. The G╎ui and G╎╎ana languages allow reference to concepts regarding landform, including a concept that encompasses a sequence of woodlands and basins (represented as lines in the diagram). When they travel long distances (from S to G in the diagram), they frequently pass through such sequences.

These classes of ecological knowledge are actually integrated within the practices of wayfinding and are also applied flexibly in the changing environment today. Before I describe this in more detail, an outline of the ethnographic circumstances is necessary.

2. SUBSISTENCE IN THE NEW SETTLEMENT

The lifestyle of the G╎ui/G╎╎ana requires the ability to range throughout a vast area, now encompassed by the CKGR, which was established in 1961 and covers approximately 52,000 km^2. Like most other San groups across southern Africa, however, their lifestyle has experienced several dramatic changes. Since the 1970s, the Remote Area Development Programme has affected most of the San living in Botswana. Local infrastructure, such as wells, schools and clinics, has been developed at several settlement sites. !Oi !om became the largest G╎ui/G╎╎ana settlement. In 1986, the national government decided to encourage CKGR residents to resettle outside the reserve. Eleven years later, those who favored relocation began to move to Kx'oensakene, a new settlement located outside the CKGR. The migration snowballed, and most !Oi !om residents resettled in Kx'oensakene.

Because the government initially implemented relocation only for those who agreed to move, a considerable number of people chose to remain in the villages within the CKGR. However, in 2002, the government cut off the water supply and other services in the remaining villages within the CKGR, and sent officials and trucks to ensure that all remaining residents moved. The First People of the Kalahari, a local NGO that fought for the rights of the San, filed a case against this policy implementation, claiming that it was a forced relocation. After a long legal battle, 189 residents who had moved to Kx'oensakene in 2002 were allowed to go back to the villages inside the CKGR in 2006. Despite this landmark court victory, however, it is still difficult for the G╎ui/G╎╎ana to make a sustainable living inside the CKGR. Notably, the right to freely enter the CKGR was not granted

to the majority of the Gǀui/Gǁana, who were relocated before 2002. Bringing domestic animals from outside the reserve into the CKGR is also prohibited. The government has declined to restart many services in the villages inside the CKGR. As a result, the majority of the people who used to reside within the CKGR, including in communities other than the !Oi !om, have resettled at Kx'oensakene, Kaudwane, and Xere, all of which are situated outside of the CKGR.[2]

Since the 1997 relocation, the multidisciplinary research team of which I am a member has conducted intensive field research amongst the Gǀui/Gǁana (e.g., Maruyama, 2003, 2010; Nonaka & Takada, 2004; Takada, 2006, 2008). One of our aims is to examine how the Gǀui/Gǁana have applied their ecological knowledge to their new geographical setting. Although they had accumulated an immense knowledge of place names, the places around their new environment were not named. The majority of places that have Gǀui/Gǁana names are distributed within the CKGR (Ikeya, 1989, 1994). Moreover, the Gǀui and Gǁana people often state that they do not know the land around the new settlement.[3] Subsequently, several cases occurred in which Gǀui/Gǁana people lost their way in the unfamiliar environment. For example, Takada (2006) describes one such occasion on a return trip after transporting horses from Kx'oensakene to a cattle ranch near Ghanzi.

Furthermore, useful game and plants are scarce outside the CKGR. Takada (2002) compared the perceived distribution of edible game (48 species) and plants (60 species) between the previous and current settlements. The interviewees agreed that most edible game and plants are less accessible in the area surrounding the new settlement, Kx'oensakene. Indeed, this scarcity is the reason why the Gǀui and Gǁana did not traditionally live in this area. Maruyama (2003) also reported the lack of natural resources around Kx'oensakene.

In response, the government has encouraged the Gǀui/Gǁana to engage in other subsistence activities. First, the government provided the residents with either 5 cattle or 15 goats in compensation for their relocation. Many of the residents chose cattle, the most precious livestock in the area. Of 135 households surveyed in 1999 and 2000, approximately one-quarter of them owned cattle, all of which were provided by the government after the relocation (Takada, 2002). One-quarter of the households owned goats, which they had obtained prior to the relocation, although only 7% of residents owned more than nine goats because the distribution of goats by the government was delayed. In addition, roughly one-third of the households owned horses, which were purchased with the compensation money received for their relocation. Holdings of other types of livestock (e.g., donkeys, hens and dogs) also increased after the relocation.

For those who wanted to farm, the government offered land leases of 1 or 2 hectares per household, which were used to cultivate crops such as maize, cowpeas and watermelon. In December 2001, I counted 58 fields under cultivation (Takada, 2002). Of these, 40 were officially allocated to the residents by the government, and 18 were individually cleared by residents.[4] The people lived close to their fields, some remaining there even after the harvest. In addition, the government provided various types of wage labor such as construction work (paid 168–310[5] pula per month), income-generating programs such as dressmaking, carpentry and candle making (paid 350–400 pula per month), and pensions

(110 pula per month), as well as food aid to the residents.

In summary, given the lack of knowledge of landmarks, the scarcity of traditional foods and the promotion of other subsistence activities, foraging activities were expected to decline in the new geographical setting. However, a large number of the Gǀui/Gǁana residents in Kx'oensakene continued to hunt. In December 2001, I interviewed 254 Gǀui/Gǁana male residents; 153 of them (approximately 60%) reported that they had continued to hunt after the relocation (Takada, 2002). Maruyama (2003, 2010) also reported that hunting and gathering were major activities outside the resettlement site.

3. FORAGING EXCURSIONS IN THE NEW GEOGRAPHICAL SETTING

To investigate why and how hunting activity has continued, I accompanied Gǀui/Gǁana hunters on several excursions. By observing and describing the interactions that occurred during the outings, I sought to examine the ways in which the Gǀui/Gǁana achieve their remarkable wayfinding. Below is a case analysis of one such foraging excursion. On this occasion, the hunters travelled approximately 8 km west of Kx'oensakene along the main road and then moved onto a trail built by Tswana merchants. This trail is close to hard terrain, which is the habitat of springhares (*Pedetes capensis*), a preferred prey item for these hunters. Although the terrain did not have a particular name, it was known to the Gǀui/Gǁana who had become familiar with the area after accompanying the merchants to collect firewood. The merchants had visited Kx'oensakene from a nearby town called Ghanzi.

During the foraging excursion, I took photographs approximately every 15 min using a camera equipped with a global positioning system (GPS) receiver. The latitude and longitude of the location are indicated at the top of each photograph. Figure 2 illustrates our route mapped on the Landsat imagery of the area. The primary Landsat imagery of the area was recorded in January 2001, which was the beginning of the rainy season, 5 years before the actual excursion occurred. By projecting ETM+ Bands 3, 4, and 5 through blue, green and red filters, respectively, I generated a contrastive color image of a scene in which woody vegetation appears red, grass cover appears green, and exposed soil appears white or blue. Kx'oensakene is clearly recognizable because of the ground denudation that resulted from the building of the settlement. Near the settlement, one can also see an airstrip under construction and the main road for vehicular traffic stretching west to east. Dots indicate the sites where I took photos, some of which are labeled in the diagram. The numbered sites indicate the geographical location at which the photo corresponding to the same number was taken.

Plate 1 shows the landscape of the area viewed from the trail built by Tswana merchants. The landscape of the Kalahari is characterized by relative flatness. It was the beginning of the rainy season, and much of the ground was covered by green grass and shrubs. We parked the vehicle beside the trail and continued on foot.
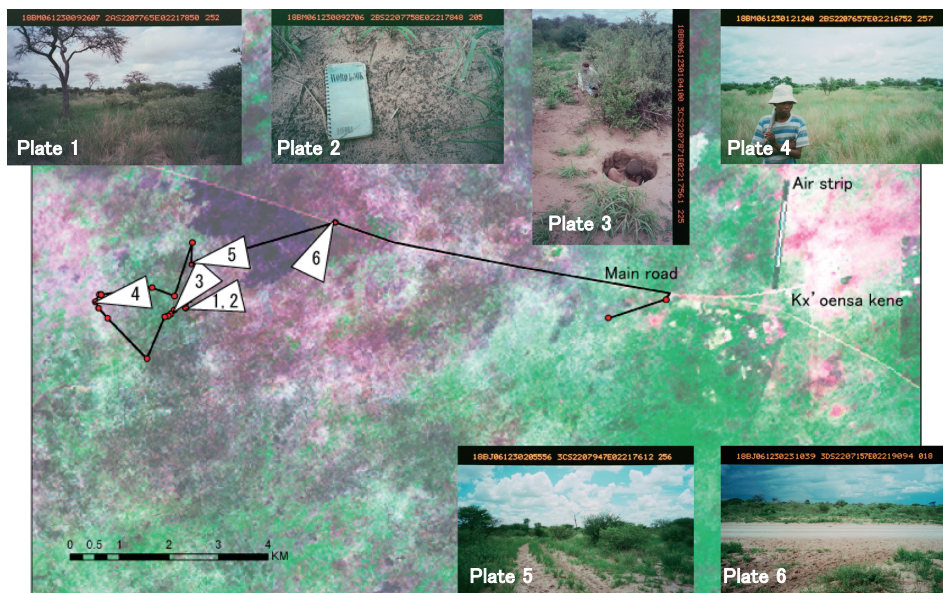
Fig. 2. Route travelled during the foraging excursion near the Tswana trail
The vertex of the numbered triangle indicates the camera angle at which the plate with the same number was taken.
Source: Landsat imagery by GLCF in Jan. 2001 and field survey by author in Dec. 2006

Because of the lack of conspicuous landmarks, it is difficult for outsiders to find their way in the Kalahari. In contrast, the G|ui/G||ana appear at ease in these surroundings. Note that in addition to grass and shrubs, sporadic trees such as *Acacia erioloba*, *Acacia nebrownii* and *Boscia albitrunca* also occur in the flat terrain (Plate 1). In their previous living area, these types of trees provided the G|ui/G||ana with landmarks in the bushveld (Takada, 2008). They could recognize specific trees despite the huge area over which they ranged. They could also refer to particular episodes in relation to these trees. For example, when they moved from !Oi !om to a place called Mankhue, they used a ||árà tree (*Acacia erioloba*) as a landmark. They also spoke of a time when they used to set a snare nearby and slaughter the animals under the tree (Nonaka & Takada, 2004; Takada, 2006). However, because their folk knowledge was accumulated mostly within their pre-vious living area, it was unknown whether they could make use of these types of trees as landmarks in the new geographical setting.

Initially, we marched in a straight line. Then, without discussing the matter first, the hunting team deployed. There must have been perceivable hints for the hunters to indicate that it was time to deploy. However, it was hard for me to fully understand what was occurring. Then, each hunter began gazing at the ground, searching for animal signs such as spoor, casts or hair. Plate 2 shows spoor of springhare, the desired prey on this foraging excursion. By examining these signs, the hunters could determine the species, the number of animals, and the size of each individual. They could also estimate the time elapsed since the animals were present. Furthermore, they were adept at inferring events in which

the animals were dynamic agents, and relaying a lively story using rich gestures (Takada, 2008).

During the foraging excursion, the hunters usually gazed at the ground, searching for animal signs. They rarely talked to each other, except while walking side-by-side or digging up a burrow. When one hunter found fresh animal signs, he examined it while the others approached him in silence. He then pushed a barbed rod down each entrance of the burrow in turn (Plate 3). The Gǀui/Gǁana hunters use a rod approximately 4 m long to hook springhares that rest in underground burrows during the day. The burrow usually has multiple entrances at a distance of several meters. According to the hunters, a pair of springhare often uses the same burrow. When the hunter sensed the response of a prey, he gently held it with the rod. After estimating the location of the springhare underground, another hunter took off his clothes and dug a vertical shaft approximately 1 m deep using an iron bar (Plate 3). The slim bar is better for making a small deep hole in the fine sand of the Kalahari than other types of digging instrument, such as a spade. It took only 15 to 20 min to dig the hole. While they were digging up the burrow, they sometimes discussed the underground shape of the burrow and the movements of the prey. The remaining hunters sat on the ground and chatted in a relaxed manner. When the springhare was pulled out of the burrow, the hunters broke the thighbones and beat the animal until it died. After capturing the springhares, young hunters tied the forelegs of the animals to a stick and placed the stick on their shoulders. The hunting team then redeployed in search of the next burrow.

Later, we came upon hard terrain with an uninterrupted view, which the hunters called ǂàà (Plate 4). ǂàà can be roughly translated as 'a wide land without trees where one can only see grasses' (Nakagawa, Sugawara, & Tanaka, unpub.). Furthermore, the hunters added that ǂàà is a sandy place where little limestone or stone is found; the sand of ǂàà is hard, and few ǀqárì (*Acacia nebrownii*) grow there. According to the hunters, springhares prefer the landform and vegetation of ǂàà, and the hunting team had intended to visit this particular area when planning the excursion.

During the outing, we came close to the Tswana merchant trail several times. When questioned about the point of departure, the hunters confidently pointed in the correct direction. They could also indicate several specific trees that served as landmarks along their route. Approximately 4.5 hours after leaving the vehicle, we returned to the point of departure. The hunters had captured five springhares and one yellow-billed hornbill (*Lophoceros flavirostris*). After with lunch, we drove up the Tswana merchant trail again (Plate 5) and came out onto the main road (Plate 6). In the late afternoon, we returned to the camp, which was located on the outskirts of Kx'oensakene.

In summary, after leaving the vehicle on the Tswana merchant trail, the hunting team walked southwest and then northwest, and sometime later crossed the twisting trail again, then continued the hunt heading east. Although the hunters appeared to have their attention fixed on the ground, they could deploy and gather together while expressing few words, and also easily indicate the point of departure. This suggests that, while walking, they sensed the configuration of the eco-

logical features that surrounded them, perceived minute differences in the shape of trees, and could therefore use specific trees as landmarks and the trail as a frame of reference. In the next section, I will argue that such Gǀui/Gǁana practices of wayfinding in their new geographical setting are an application of strategies developed in their previous geographical setting.

4. FORAGING EXCURSIONS IN THE DRY VALLEY

Although flatness is one of the major characteristics of the Kalahari, the landform also contains shallow hollows and low rises. The Gǀui/Gǁana use various spatial concepts to represent the landform, which play an important role in their wayfinding practices. A *'ǀqāā,'* roughly translated as dry valley, constitutes an example of such a concept. In this section, I analyze face-to-face interactions that took place during another foraging excursion to a ǀqāā. This analysis demonstrates how the ecological knowledge of the Gǀui/Gǁana is used to travel outside their previous settlements. I deduce particular types of interplay between the structure of the Kalahari environment and Gǀui/Gǁana spatial cognition. Moreover, I demonstrate that the Gǀui/Gǁana practices of wayfinding in the new geographical setting as reported in the previous section are an application of strategies developed in the previous geographical setting.

For the Gǀui/Gǁana, an important component in conceptualizing a ǀqāā is the practical use of natural resources there. For example, the Gǀui/Gǁana expect that a series of *'ǁχáú'* (woodland) and/or *'!óò'* (basin) will occur within a ǀqāā. Both ǁχáú and !óò provide them with valuable resources such as firewood and edible plants and thus have been used as stops when moving camp or during trading trips. The Gǀui/Gǁana, accordingly, sometimes use ǀqāā as pathways (Nonaka & Takada, 2004). Moreover, a ǀqāā is an important hunting place for the Gǀui/Gǁana. It is said that the sands of a ǀqāā are soft, and plant species that grow in soft sand flourish within a ǀqāā. Herbivores that graze on these plants also frequently appear in a ǀqāā. They eat soft grasses in the hollows of the ǀqāā when it is cool and retire to woodlands situated along the banks of the ǀqāā as the temperature increases during the day. The Gǀui/Gǁana often made hunting excursions to search for these animals.

On one occasion, I accompanied the hunters and their families to a place called Xoipan, where an electric pump supplied groundwater to Kx'oensakene. Xoipan is located close to the CKGR boundary and in the hollow of a ǀqāā. The vehicle was parked near the campsite of the engine caretaker. Women and children remained near the vehicle to gather useful plants while the males, including myself, walked further afield to hunt springhares that frequently situate their burrows in ǁχáú along the banks of a ǀqāā. When hunting, a nearly 4 m long rod with a hook is inserted into the burrow of a springhare to immobilize a springhare resting. This is followed by digging a hole from directly above the springhare while it is held still, and subsequently pulling it out from the hole (Tanaka, 1980: 35).

I mapped our route on the Landsat imagery of the ǀqāā (Fig. 3). The Landsat

imagery was recorded during the rainy season in January 2000, four years before the excursion took place. As indicated in the previous section, I generated a contrastive color image of a scene in which woody vegetation appears red, grass cover appears green, and exposed soil appears white or blue. One can clearly recognize the border of the CKGR, stretching north to south in a straight line. The relatively densely vegetated area appears red, which illustrates the flow of the |qāā, while grassy ground appears green and exposed soil appears white or blue. Broadly speaking, the |qāā ran west to east across the region, but at the place where the excursion occurred, the |qāā twisted in meandering creeks.
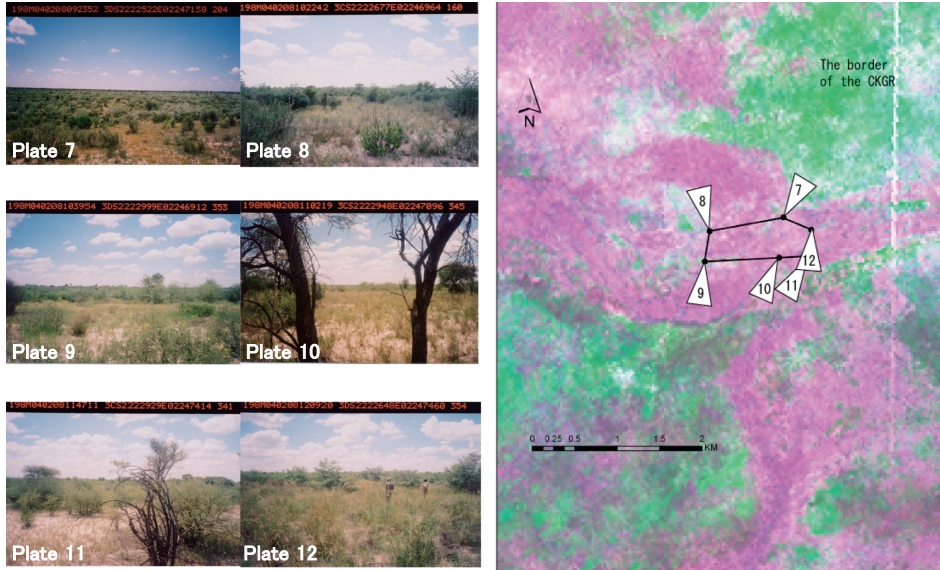
Fig. 3. Route travelled during the foraging excursion around the |qāā
The vertex of the numbered triangle indicates the camera angle at which the plate with the same number was taken.
Source: Landsat imagery by GLCF in Jan. 2000 and field survey by author in Dec. 2004

   I photographed the area from several locations, which correspond to the numbered sites on the mapped route, and used a GPS receiver to level the camera to the hollow of the |qāā. After leaving the vehicle (Plate 7), we walked west into the middle of the |qāā. Then, we reached a ridge surrounded by the creeks of the |qāā (Plate 8), and went south along the ridge. After passing a group of ŋ|ùnī trees (*Boscia albitrunca*), we turned east (Plate 9) and then crossed the |qāā again.
   The following excerpt is from a conversation that took place when we came close to the other side of the |qāā (Plate 10). Finding fresh signs of springhare, a hunter (who did not talk in Excerpts 1 and 2) pushed his rod down into the burrow and another hunter (who also remained silent) dug a vertical shaft. The other hunters (K, G & T) and I gathered beside these hunters. At that time, K & G were men of middle and old age, estimated to be in their 40s and 60s, respectively. T was a young person in his 20s. After the conversation, we con-

tinued to walk east and then turned north (Photo 11) and then northwest (Photo 12) in the middle of the ǀqāā. Then, we returned to the vehicle, near which the women and children had already gathered many edible plants.

Excerpt 1 [(6)]

1 A(Author): kúní-sì   mãã   dà   hãã [1]
              car-f:s:N INTERR PP(dir) be
              Where is the vehicle?

2 K: [ŋǀĩĩ   sì   cíé]
        DEM(near) 3:f:s:n stand
        [This ((way)) it stands.]

Plate 13 K(center) and G(right) simultanously
              pointed in the same direction

3 G: [ŋǀĩĩ   ŋǀĩĩ   ʔáā   kúní-sì ʔí [2]] =
        DEM(near) DEM(near) DEM(far) car-f:s:N PTC
        [This ((direction)), this ((direction)), that, ((that is)) the vehicle] =

4 K: = ŋǀĩĩ   ʔáā   ʔá-ǁàà   kà   kúní-sà =
        DEM(near) DEM(far) 1:m:p(in):G PP(pos) car-f:s:A
        = This ((way)), that is our vehicle=

5 G: = sì   <u>cíé</u>
        3:f:s:N stand
        It   <u>stands.</u>

6 A: hhh =
        hhh =

7 G: = ŋǀĩĩ   χo-wà [3]   tsé   cíé hh   sà   [mûũ]
        DEM(near) place PP(loc)   2:m:s:N stand   3:f:s:A see
        = In this place you stand hh ((then you can)) [sense[(7)]] it ((i.e., the vehicle)).

8 A: [hh]
                                                        [hh]

9 K: ʔáā   ìĩ-dzì   tsá   cúá sà   mûũ-kàχó [4] =
        DEM(far)   tree-f:p:A 2:m:s:A NEG 3:f:s:A see-CAU
        Those trees prevent you from sensing it ((i.e., the vehicle)).=

[1] Following this utterance, both K and G looked backwards and used their right hands to point far away.
[2] T stood up and pointed in the same direction as K and G were pointing, using his right hand.
[3] G and K looked at A again. G then pointed slightly backward. He then picked up a grass stem and used it to push leaf tobacco (rolled up in paper).
[4] K turned backward and pointed in the same direction as before (see line 1).

    Prior to this conversation, I was unaware of having crossed the ǀqāā. This is due to the undulation of the ǀqāā. I did not even realize at which point we left the bank when walking around. The informants were looking at the signs the

animals left near each burrow and inserting a rod hook into the burrows, which is a procedure they repeated while spreading out and gathering. While doing this, they seemed to focus on investigating whether springhares were in the burrows. During the hunting, they had only a limited conversation and did not seem to mention movement paths among them.

Lines 1–5

Following my question in line 1, K and G simultaneously looked at me and then looked backward and pointed in the same direction in lines 2 and 3, respectively (Plate 13). Slightly later, T stood up and pointed in the same direction as the others. He thereby indicated the direction of the vehicle to me (hereafter identified as A) while he displayed gestural alignment with K and G. The gestural accordance indicates that the hunters took each other's bodies into account as they built relevant action in concert with each other (Goodwin, 2003). In addition, they answered A's question by overlapped utterances (lines 2 and 3). In these utterances, both speakers (K and G) used the proximal demonstrative *'ŋǀǚ'* (this), which indicated the direction of the vehicle. Note that the vehicle itself was parked far away and was indicated by the distal demonstrative *'ʔáā'* (that) in line 3. After expressing the proximal demonstrative, K formulated a short sentence *'sì cíé'* (it stands) in line 2, whereas G expressed the distal demonstrative and a short sentence *'ʔáā kúní-sì ʔí'* (that, ((that is)) the vehicle) in line 3.

Following these utterances, K restarted talking, which is seen as an 'overlap resolution' (line 4). The reformulated utterance is closer in content to the prior utterance of the other speaker G (line 3) than to that of the current speaker K (line 2). In the middle of the sentence, G appended it and gave an utterance (line 5), the content of which was a partial repetition of K's utterance in line 2. These interactions indicate a corporative stance between two speakers, K and G. That is, they did not compete in answering but co-constructed the answer to A's question.

Lines 6–9

A's reaction, however, was relatively ambiguous. Specifically, in line 6, he just laughed. The laughter neither indicated the extent of his understanding of the answer, nor served as a closure to the sequence that he had initiated. Rather, it worked as a 'continuer'[8] to the answer. G therefore followed up the answer and suggested that A come closer to him so as to sense the vehicle. Simultaneously, G picked up a grass stem. He presumably recognized that the question-answer sequence was reaching its termination and thus initiated a different activity, namely smoking tobacco. A again laughed, which functioned as a continuer. This time, it was K who reformulated the explanation. He gave an account of why A could not recognize the vehicle (line 9). At the same time, K turned backward and pointed in the same direction as he had done in line 1 to indicate the trees that

prevented A from sensing the vehicle.

These utterance exchanges indicate that it was only the author who was not aware of the situation, while others were moving forward confirming their where-abouts without much oral communication among themselves. Then, responding to an inquiry by the author, K further explained the movement paths as follows.

Excerpt 2 (Cont. from Excerpt 1)

10 A: =e:i(0.8) mãã cʰānā(0.6) ʔá-‖àà   mãã (0.4) [kúní-sà   χúū yà ¹]
        INT INTERR like   1:m:p(in):N INTERR   vehicle-f:s:A leave and
        =Yeah(0.8), how (0.6) did we [how (0.4) ((did we)) leave the vehicle and]

11 K: [ʔá-‖àè   (ŋ|ĩĩ)]
        1:m:p(in):N DEM(near)
        [we (this)]

12 G: [(ŋ|ĩĩ   χò)]
        DEM(near) place
        [(This way)]

13 K: ŋ‖áã ŋ|ĩĩ-dzì   [ʔá-‖àè   dōrē ²
        ADV DEM(near)-f:p:A 1:m:p(in):N turn
        There, at these ((trees)) [we turned=

14 G: [e he:i]
        INT
        [Yeah]

15 A: [ʔá-‖àà]   ʔáā -sì   χò χúū yà ³
        1:m:p(in):N DEM(far)-f:s:G place leave and
        [We] left there and

16 G: e he:i =
        INT
        Yeah =

17 K: = ae ʔáā   ŋ|ùnī-dzì   kà χá ⁴ ʔá-‖àè   dōrē.
        INT DEM(far)   -f:p:N PP(pos) FOC 1:m:p(in):N turn
        =Yes, at those ŋ|ùnī trees, we turned.

18 A: má   mãã   ŋ|ùnī ⁵ =
        INTERR INTERR
        What? Which ŋ|ùnī ((tree))? =

19 K: = ŋ|ĩĩ   [ʔáā] ŋ|ùnī !áò-m̀   ʔáā   gúrī-sì   hãã χò ⁶
        DEM(near) DEM(far)   tall-m:s:G DEM(far) many-DRV(adv) be place
        This ((way)), [at that] tall ŋ|ùnī ((tree))⁷, at the place where those many ((ŋ|ùnī trees)) are.

20 T: [ŋ|ĩĩ]
        DEM(near)
        [This ((way))]
        (2.8)

21 K: ʔáā   χò χá ʔá-‖àè   dōrē.
        DEM(far) place FOC 1:m:p(in):N turn
        At that place, we turned

22 A: mh:m
       INT
       mh:m

23 K: ŋǀĩ̃   χò   kámà [8]   ŋǀĩ̃   tʰana àà
       DEM(near) place   pass   DEM(near) like   come
       ((We)) passed this side, ((and then)) came like this.

Plate 14 *K(center) turned his right Plate hand.* **Plate 15** *K brought it toward around his chest.*

1 Immediately after this utterance, K pointed in the same direction as G (slightly
left of the direction indicated in line 9).

2 G turned his face to the screen.

3 Immediately after this utterance, K turned toward A and gazed at him while con-
tinuing to point (see line 10).

4 K turned to the direction in which he was pointing.

5 Immediately after this utterance, K pointed to a higher place than before. Slightly
later, T pointed in almost the same direction that K was pointing in.

6 K turned toward A, continuing to point. T lowered his hand.

7 Although there are many *ŋǀ ùnī* trees at this location, one is much taller than the
others.

8 K turned his right hand around (Plate 14) and brought it toward his chest (Plate 15).

Lines 10–17

In line 10, A acknowledged the explanation given by K (line 9) and then
inquired about the route taken to reach this point. The wh-question (what? who?
where? when? why?) shifted the spatiotemporal setting of the telling back to the
beginning of the foraging excursion. The author thereby facilitated the telling of
the route. Again, K and G replied simultaneously, overlapping their utterances
with the latter part of the question (lines 11 and 12). To describe the route, both
K and G used the proximal demonstrative '*ŋǀî̃*' (this), which was assisted by
pointing. In these utterances, although both speakers demonstrated that they
attempted to answer the author's question, their ways of doing so differed. That
is, K gave a sentence initiation that implied that the answer would continue fur-
ther (line 11), whereas G, who had started to smoke, completed the action in this

line (line 12).

K subsequently restarted the answer, which is seen as an overlap resolution in line 13. The utterance was reformulated into a more descriptive expression, *'ŋ‖aã ŋ‖ṹ-dzì [ʔá-‖àè dōrē'* (There, at these (trees), we turned). G then latched on to the utterance and gave an acknowledgement, which displayed his recognition of K's tellership in explaining the route.

Overlapping with G's acknowledgement, A checked his understanding of the explanation (line 15). By mentioning the point of their departure (We left there and …), he separated the route into the place where they had left the vehicle and the location where the *ŋ‖ùnī* trees grew. Immediately after this utterance, K turned toward A and gazed at him, continuing to point in the direction of the trees. G then offered confirmation of A's understanding. In addition, K confirmed A's understanding with an affirmative *'ae'* (yes). He then indicated the route around the *ŋ‖ùnī* trees again. This time, instead of the proximal demonstrative *'ŋ‖ṹ-dzì'* (these) (line 13), K articulated the name of specific trees, saying *'ʔáã ŋ‖ùnī-zì'* (those *ŋ‖ùnī* trees), with a postposition *'kà'* (toward) and a suffix *'χá'* that indicates focus or emphasis. The reformulation demonstrates that K was not sure whether A understood the exact place at which they turned and thus clearly denoted it by mentioning its landmark. Immediately after the phrase, K turned his face and gazed at the direction in which he was pointing. He thereby led A's gaze to the direction of the trees.

Lines 18–23

In line 18, A gave a follow-up question, asking which *ŋ‖ùnī* tree K had indicated. Note that A used the singular form here, whereas K had used the plural form in the previous utterances to mention the tree(s). K then denoted a single *ŋ‖ùnī* tree, in accordance with the form of A's question. That is, immediately after A's utterance, K pointed to a higher place than before. The gesture not only pointed to a particular *ŋ‖ùnī* tree, which was located on the ridge surrounded by the *‖qāā,* but it also depicted the shape of the tall *ŋ‖ùnī* tree. K additionally pointed out the tallest *ŋ‖ùnī* tree amongst the same type of trees in line 19. As in lines 2 and 3, K used the proximal demonstrative *'ŋ‖ĩ̃'* (this) to indicate the direction from his body to the tree while he used the distal demonstrative *'ʔáā'* (that) to indicate the tree itself. Slightly later, T pointed in almost the same direction that K was pointing and expressed the proximal demonstrative *'ŋ‖ĩ̃'* (this) (line 20). He thereby expressed alignment with K.

After line 20, a relatively long pause (2.8 s) occurred. During the pause, K glanced at A, to check whether A had understood his prior utterance/gesture and then noticed another hunter digging a hole for the springhare hunt. A did not ask about the tree again. The silence indicates that he did not require any further explanation of the trees. Consequently, the side sequence from line 15 was completed. K then restarted the telling, the contents of which have already appeared in lines 13 and 17 (line 21). This time, reflecting the previous discussion about the *ŋ‖ùnī* trees, K mentioned the place using the distal demonstrative *'ʔáā'* (that),

which requires the recipient to have sufficient background knowledge to infer the referent assumed by the speaker (Hanks, 1992: 58–59).

Following A's continuer (line 22), K further explained the route by combining talk with gesture (line 23). He described the route as *'ŋ|ĩ̃ χò kámà'* (((We)) passed this side) and then *'ŋ|ĩ̃ tʰana àà'* (came like this), turning his right hand around (Plate 14) and then bringing it towards his chest (Plate 15), respectively. In these gestures, his right hand was used to track the landforms they used for the route; simultaneously, the motion of the same hand represented the movement along this route. These inter-related aspects of gesture reached a rather beautiful climax when he brought his right hand towards his chest and pointed to himself. That is, K located his own body at the center of the entire ecological setting, in addition to using it as the terminal of the depicted pathway.

5. DISCUSSION

In what follows, I highlight the following theoretical implications deduced from the analyzed interactions: (1) the facilitation of interactions through participants' diversity; (2) the coordination of attention within interaction systems; (3) features in the interplay of utterances, gestures and other signs; and (4) the organization of interactions and the structure of the environment.

The participants clearly had varying degrees of sensitivity to the environment, as well as various stances for the foraging excursion. For example, both K and G were knowledgeable about the ecology around Xoipan. However, whereas K actively engaged in the springhare hunting, G participated in it mainly as an observer. T was the youngest and least knowledgeable about the ecology of the area compared to the other hunters. The author (A) had recently come into the community as a researcher and was inexperienced in the springhare hunt.

Interactions occurred not only among the members of the speech community but also between members and outsiders such as the author. The diversity of the participants did not obstruct, but rather facilitated interactions, which formed a distinctive participation framework (Goffman, 1981) during the foraging excursion. In this context, our examples are characterized by repetitive occurrences of instruction. In Excerpt 1, for example, as a response to A's question (line 1), K and G immediately and simultaneously began to give A instructions, in which they not only answered the question (lines 2–5) but also indicated how to stand to perceive the vehicle (line 7) and explained why A could not perceive the vehicle (line 9). T also pointed in the same direction as K and G, whereby he gave an instruction to A while at the same time displaying alignment with G and K. Therefore, through the activity of instruction, G|ui/G‖ana ecological knowledge, which usually constitutes the background knowledge that organizes daily activity, became available not only to A but also to the less knowledgeable hunter T. Moreover, a variety of actions were executed to achieve mutual understanding amongst the participants of the interactions. Hence, in these situations 'the intersubjective foundation of fieldwork,' a factor that is excluded from many serious ethnographic texts (Clifford, 1986), has been integrated into

the sequential organization of the activity of instruction.

One of the key attributes to achieving mutual understanding in (but not limited to) the activity of instruction involves coordinating the attention of the recipient within a larger set of interaction systems. The deictic gesture produced by T in line 3 indicates the position of the author's vehicle, as do the utterances and deictic gestures of K and G. It is obvious from T's position and posture and the timing of the gesture in line 3 that he had been watching and listening to the preceding actions (Plate 13). Thus, it may be assumed that T pointed in the same direction following K and G, possibly mimicking them. Alternatively, it can be said that T used the words and gestures expressed by K and G as a resource to tell the author the position of the vehicle. In this way, cultural meanings expressed by a participant become available for other participants.

It is worth emphasizing here that through this deictic gesture T puts himself in the position of giving advice to the author, that is, placing himself in the same position as K and G, while simultaneously disclosing a common point of view to K and G. In this way, the gap in experience between T and K/G becomes obscure for the time being, and these three informants form a single party by showing a common point of view. In different contexts, the purpose of indicating the position of the vehicle to the researcher is replaced with tracking down game or arriving at camp. In any case, social interactions in everyday practices are conducted and disclosed to accomplish a specific purpose in the given context.

When analyzed in greater detail, the above examples demonstrate that utterances, gestures and other signs (e.g., postural orientation, gaze) were efficiently used and co-ordinated to achieve their purpose in the following ways. First, speakers often restarted telling by reformulating the contents. In Excerpt 2, as a response to A's understanding check, K replaced the phrase *'ŋǀíũ̃-dzì'* (these) (line 13) with *'ʔáã ŋǀùnī-dzì'* (those *ŋǀùnī* trees), adding a postposition *'kà'* (towards) and a suffix *'χá'* that indicates focusing (line 17). The reformulation directed A's attention to the trees and then elicited the follow-up question (line 18).

Second, symbiotic relationships between utterance and gesture were formed effectively. In Excerpt 1, when two speakers K and G co-constructed the answer to A's question, they combined proximal demonstratives with deictic gestures (lines 2 and 3). The proximal demonstratives called the recipient's attention to the speaker whereas the deictic gestures oriented it in the direction, starting from their bodies, to the referents.

Third, gestures once expressed were used subsequently for different actions. In Excerpt 2, responding to the question by A, who is not good at identifying the species of tree (line 18), K pointed to a higher place than before (line 19). The gesture not only indicated the *ŋǀùnī* tree that grew some distance away (deictic gesture) but also depicted the shape of the tall tree (depicting gesture). For the latter aspect, K used the tip of his right hand, which had been used for making the deictic gesture, as a scaffolding point to depict the shape of the tall *ŋǀùnī* tree. This was effective because A had already looked at the point when K made the deictic gesture, and the following depicting gesture could subsequently draw his attention.

Fourth, the speaker's gaze was used efficiently to catch the recipient's attention. In Excerpt 2, after A checked his understanding of the route, K turned his face toward A after pointing in the direction of the trees. K then confirmed A's understanding with an affirmative (lines 15–17). Here, K's gaze was used to share the focus of their attention. After expressing the phrase that mentioned the *ŋǀùnī* trees, K turned his face and gazed at the direction in which he was pointing, leading A's gaze in the direction of the trees (line 17). A speaker's gaze is highly effective for eliciting a recipient's gaze (Tomasello, 1999). This provides a foundation for the organization of seeing as a form of public practice (Goodwin, 2000b).

As explained above, the speaker used various types of semiotic resources (Goodwin, 2000a) to manage the attention of the recipient. However, to fully understand the symbiotic relationships of these semiotic resources, the structure of the environment in which the participants of the interaction are involved must be examined. When the Gǀui/Gǁana walk through their living area (the CKGR), the environment of their vast living space constitutes a resource to (re)generate particular cultural meanings. Accordingly, the way in which their actions are embedded in the environment displays how the Gǀui/Gǁana experience the space. Of particular interest is how the hunters used the proximal demonstrative *'ŋǀ$\tilde{i}$'* (this). In Excerpt 1, for example, *'ŋǀ$\tilde{i}$'* (this) was used to indicate the direction towards the vehicle, whereas the distal demonstrative *'ʔáā'* (that) was used to indicate that the vehicle was parked far away (lines 2 and 3). The proximal demonstrative called the recipient's attention to the gestures, which indicated the direction running from the speakers' bodies to the referent. Moreover, it indexed the spread of perception that the speaker experienced. That is, the perception of a distant object involves a process of projection that originates in one's body and expands towards the target object. The symbiotic use of the proximal demonstrative with deictic gestures such as pointing often occurred in this perceptual process.

A different aspect of this perceptual process is observed in Excerpt 2. Following A's continuer (line 22), K described the route by turning his right hand around and then bringing it towards his chest, (line 23). He used his right hand to track the landform used for the route and to represent the motion of movement along it. Furthermore, when K brought his right hand towards his chest and pointed at himself, he located his own body at the center of the entire ecological setting while using it as the terminal of the depicted pathway. At this moment, the 'ecological huddle'[(10)] within which an arena for mutual orientation, shared attention, and collaborative action had been constituted (Goodwin, 2003), dissolved in the environment. In these actions, his senses symbolically expanded from his body, reflected upon the environment, and finally concluded on his body. The entire landscape occupied and overlapped the place where his inner self was centered. That is, he embodied the entire environmental space. To borrow the words of Leroi-Gourhan (1973: 315–318), K must have been visually confirming the path, which the party had been walking round, within the space radiating from their own bodies in every direction.

6. CONCLUDING REMARKS

This study revealed several strategies used by the Gǀui/Gǁana to produce utterances, gestures, and other signs (e.g., postural orientation, gaze) in their previous geographical setting. The fragments of interactions that I have analyzed here demonstrate that during the foraging excursions around the previous settlements the hunters were continuously orientating themselves, whereas I was unable to track our location. When I asked about the route taken, the hunters could immediately indicate it. This was because they used the trail and the ǀqāā as frames of reference, in addition to particular trees as landmarks, to grasp their relative location and decide their course of action. Given the relatively flat terrain, a keen sense of orientation is necessary to use a ǀqāā or a trail as a frame of reference. With such ability, they can easily make adjustments to take into account any deviations from the route, despite the dense bush that sometimes prevents them from perceiving each other's position. Moreover, the use of utterances and gestures demonstrates how the Gǀui/Gǁana experience the space. By locating their body at the center, they use the ecological setting as a resource for communication and embody the space. They thereby attempt not only to clarify the features of things that they face but also the possibilities that they may encounter. In other words, they are keen about attending and responding to the 'affordances (Gibson, 1979)' in the environment. In doing so, the hunters have begun to create their personal environment. By the phrase 'personal environment,' I mean that they not only become familiar with their environment but also personalize it; that is, they perceive their environment as an agent that may cause a change in their existing state.

These strategies are also efficient for the purpose of understanding the characteristics of their spatial perception in the new geographical setting with which they have recently become familiar. In this new environment, the Gǀui/Gǁana hunters use human artifacts such as the Tswana merchant trail as a frame of reference. In this vein, Hutchins (2005) investigated the interplay between material and mental structures of cognition in the wild, and asserted that some physical objects work as 'material anchors' to form conceptual blends. Taking our case as an example, when the hunters detect the moving route, it is not necessary for them to have a mental representation of the entire landscape. Rather, the route emerges from a blend of mental and material structures in real space (Fig. 4). Fig. 4 indicates that a similar shape of trajector is associated with the set of landmarks and the surrounding landform in both old (the material structure around the ǀqāā shown in the upper-right diagram) and new environments (the material structure around the Tswana merchant trail shown in the upper-left diagram). Note that this view is radically different from the common image of language use as merely a transfer of abstract information from the mind of sender to that of receiver. Thus, after moving to their new geographical setting, the hunters began to activate a mental structure in which the embodied processes of springhare hunting functioned as (somatic) anchors. They then combined this mental structure with the material structure, in which several trees and the Tswana merchant trail are located, to produce a conceptual blend, namely a sequential flow through the

landmarks and landforms in the environment (the lower-left diagram in Fig. 4). This may explain why they were able to make the decision to deploy the hunting team without discussing it openly.
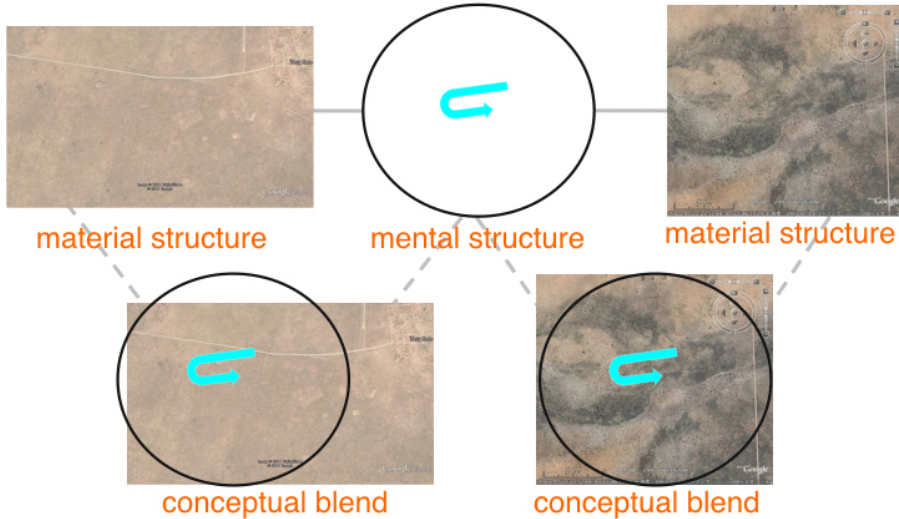
Fig. 4. The conceptual blend of a trajector with the set of landmarks and the surrounding landform, forming a moving route in the blended space

This analysis reveals that the mental structure that the hunters have developed can be blended with both natural landforms such as dry valleys and human artifacts such as the Tswana merchant trail. Therefore, the contrasts between natural landforms and human artifacts, as well as between old and new environments, are not mutually exclusive in actual everyday practice. In other words, the divide between human artifacts and natural landforms as well as between previous and new environments is bridged in the practices of wayfinding. While engaging in these practices, the hunters became familiarized the new environment, as they had done in their previous living area. The trail was chosen as a hunting site because it was near the natural habitat of springhares, whereas dry valleys might have experienced human effects through the repetitive involvement of the Gǀui/ Gǁana in foraging activities there. Overlap can also be seen between old and new circumstances. In the new location, the hunters attempted to locate features similar to those in their previous environment. Even before the Gǀui/Gǁana were made sedentary, the extreme variation in annual rainfall required hunters to be flexible in choosing their foraging sites, which also varied in appearance (e.g., shape of trees, type of vegetation). The Gǀui/Gǁana have made extensive use of this arid environment. The use of their ecological knowledge is distinctive in the interplay between the accumulation of empirical observations and the use of imagination in the environment, which itself is also in constant flux.

Gǀui/Gǁana use of ecological knowledge, which constitutes a variant of forag-

ing modes of thought (Barnard, 1992), is distinctive in its interplay between the accumulation of empirical observations and the use of embodied imagination in a changing environment. Since their relocation, the lifestyle of the G|ui/G|lana has entered a new phase. However, through their imagination and active engagement with their environment, they are able to apply their ecological knowledge flexibly in their new environment and manage their new circumstances with the keen sense of foragers.

NOTES

(1)   Duricrust consists of various forms such as iron-rich ferricrete, silicic acid-rich silcrete, lime-rich calcrete, and gypsum-rich gypcrete (Yamagata, 2005: 101). Since the surface of the pan is covered by silt, deposited salt, and calcrete, basins appear in the central regions of the pans during the rainy season.
(2)   Kaudwane and Xere are situated to the southeast and northeast of the CKGR, respectively.
(3)   The expression 'the land' refers not only to the local geography but also to foraging sites and historical monuments, which have rich social meaning for the G|ui/G|lana. Accordingly, place names are often associated with an event or episode that supposedly occurred there, and the origin of these names is of special interest. Takada (2006) provided an analysis of a conversation regarding the origin of a place name.
(4)   At the beginning of 2000, 83 cultivated fields were recognized (Maruyama, 2003: 58–59). Field cultivation flourished in the 1999–2000 rainy season most probably because of the record downpour that season. The considerable decrease in the number of cultivated fields during the 2001–2002 rainy season when less rain fell, demonstrates the adaptability of the people with respect to a variety of subsistence activities.
(5)   1 pula = 0.09 euro (October 2014).
(6)   In the excerpt, each line includes the original utterance, word glosses, and the English translation. Utterances are transcribed according to a modified version of the conventions developed in Conversation Analysis research (for details, see Sacks et al., 1974; Schegloff, 2007). Information important for the utterance is indicated in double parentheses: (()). Equal signs (=) indicate run-on utterances or an utterance that has been interrupted by someone else. Pause length is marked in parentheses, in tenths of a second (e.g., (0.6)). Overlap of utterances is marked by square brackets: [ ]. Audible laughter is indicated by the letter 'h,' and additional 'h's indicate sustained laughter. Stressed words have been underlined, and single parentheses indicate that an utterance was unintelligible or made by an unidentifiable source. Interlinear gloss abbreviations are indicated as

follows: ADV; adverb, ASP; aspect (hab-habitual, sta-state, wit-with), DEM; demonstrative, DRV; derivative (n-nominal, adv-adverbial), FOC; focus, INT; interjection, INTERR; interrogative, NEG; negation, POS; possibility, PP; postposition (dir-direction, loc-locative, pos-possession, toward-toward), PTC; particle, tense is indicated by word(s) (e.g., 'future(today)' –today's future). Person-gender-number-suffix is indicated by the combination of abbreviations (e.g., -f:p:G), in which 'm:f:c' indicates 'male: female: common', 's:d:p' indicates 'single: dual: plural, 'N:A:G' indicates 'nominative: accusative: possessive.' Suffix and stem are linked by '-' (hyphen). Pronoun is indicated by the combination of abbreviations (e.g., 1:c:p(in):N), in which '1:2:3' indicates 'single person: second person: third person', 'm:f:c' indicates 'male: female: common', 's:d:p' indicates 'single: dual: plural', 'in:ex' indicates 'inclusive: exclusive', and 'N:A:G' indicates 'nominative: accusative: possessive.'

(7)   As is the case with 'see' (e.g., 'I see') in English, *mûũ* has the sense of 'knowing' through active perception. In this utterance, G used *mûũ* even through the vehicle was not physically apparent. I thus translated it as 'sense'.

(8)   In Conversation Analysis research, 'continuer' indicates response tokens that function to retain the floor of utterance exchanges with the prior speaker and do not initiate any action (Sacks et al., 1974; Gardner, 2001; Schegloff, 2007).

(9)   Goffman (1981) advocated the notion of 'participation framework' as a means of analyzing the various interactional roles played by different people in a particular social situation.

(10) According to Goffman (1964: 135), a physical coming together is typically involved in an 'ecological huddle' wherein participants orient to one another and away from those who are present in the situation but not officially in the encounter.

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Author's Name and Address: Akira TAKADA, *Graduate School of Asian and African Area Studies, Kyoto University, 46 Yoshida-Shimoadachi, Sakyo, Kyoto 606-8501, JAPAN.*
E-mail: takada [at] jambo.africa.kyoto-u.ac.jp