EXPRESSING MANNER, LOCATION, AND ORIENTATION IN MANNER-ONLY MOTION EVENTS IN TURKISH SIGN LANGUAGE

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Abstract. The path and manner of objects in motion events have been studied in many languages. Previous research has focused on whether both path and manner are expressed in the main verb and whether manner can be omitted due to saliency, narrative style, or available linguistic constructions of a particular language. However, it is unknown to what extent language users express manner when it is salient and marked. Aiming to fill this gap, the present study asked how Turkish Sign Language (TİD) signers express location, orientation, and manner in a basic motion event including manner but not path. Eight TİD signers participated in an experiment and described what they saw in 34 brief videos to an addressee. Results showed a significant difference between expressions of location, orientation, and manner or leaving them ambiguous. While TİD signers encoded manners of motion obligatorily, they gave the locations of the objects more than their orientations. Thus, when manner is salient, it must be encoded regardless of language family or modality.

1. Introduction[1]

Typological research has shown variations in expressions of spatial relations and commonalities, such as the use of adpositions/positionals, types of reference frames involved, and segmentation of event frames (Levinson 2003, Levinson and Wilkins 2006, Bohnemeyer et al. 2011, Talmy 1983, 2000, Slobin 2004, 2006). Those differences and preferences may be in the domain of spatial cognition

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[1] SMALL CAPS are used for sign glosses by convention. CL: classifier. RH: right hand, LH: left hand, and ___: continuous sign or gesture.

(Pederson et al. 1998, Levinson et al. 2002), contextual, or task-specific (Li and Gleitman 2002, Li et al. 2011).

Expressions of motion events have been studied in many spoken languages (e.g. Beavers, Levin, and Tham 2010, Brown and Chen 2013, Bunger, Papafragou, and Trueswell 2013, Chui 2009, 2012, Gennari, Sloman, Malt, and Fitch 2002, Huang and Tanangkingsing 2005, Lakusta and Landau 2012, Papafragou, Massey, and Gleitman 2002, Slobin 2006, Talmy 2000). When it comes to expressing path and manner of motion events, languages can be grouped in three ways. First, satellite-framed languages such as English express path by satellites associated with the verb, for example, prepositions in 'go in,' 'roll down,' etc. These languages often conflate manner and path. Second, verb-framed languages such as Spanish express path by the main verb without a satellite. These languages encode path of motion events and often express manner in adjuncts, suggesting that verb-framed languages focus less on manner than satellite-framed languages. Third, equipollently-framed languages such as Mandarin Chinese express both manner and path by equal verbal elements (Talmy 2000, Slobin 2004, 2006).

In expressions of spatial relations including motion events, sign languages use the body and the signing space as well as language-specific constructions, such as classifier constructions (predicates of location, orientation, and motion), which altogether contribute to more iconic representations than those in spoken languages (e.g. Emmorey 1996, Emmorey 2002, Emmorey and Herzig 2003, Engberg-Pedersen 1993, Perniss 2007, Schembri 2003, Schembri et al. 2005, Supalla 1986, Taub 2000, 2001, Talmy 2006, Wilcox 2004). Despite iconic motivations, there can be language-specific structures in the language of spatial relations, resulting in variations across sign languages (e.g. Perniss and Ozyürek 2008, Ozyürek and Perniss 2011; Özyürek et al. 2010; Arik, 2008, 2009, 2010a, 2010b, 2011, 2012a, 2012b, 2013a, 2013b) similar to what is observed in spoken languages (e.g. Levinson and Wilkins 2006, Bohnemeyer et al. 2007, Bohnemeyer et al. 2011). Sign languages, too, appear to be verb-framed languages in which path is in the main verb, and manner and path often conflate (e.g. Slobin and Hoiting 1994, Tai and Su 2013).

Although there is now a considerable body of research on motion events, little is known on whether languages differ from each other when the manner of a motion event is salient and there is no change in path. The current study aims to fill this gap. The questions addressed in this study are the following. Being a sign language, how do Turkish Sign Language (TİD) signers express such simple motion events?

2. Previous studies

Previous studies on TİD have focused on basic expressions of space in TİD (Özyürek et al. 2010), their acquisition (Sümer et al. 2012, 2013), and those expressions compared to German Sign Language (Özyürek and Perniss 2011,

Perniss and Özyürek 2008, Perniss et al. 2011). An overview of expressions of spatial relations in TİD and comparisons of TİD with various sign and spoken languages can be found in Arik (2013a).

As do many sign languages, TİD benefits from the signing space, classifier constructions, lexical signs, and constructed actions in the expression of spatial relations of objects (Arik 2013a, 2013b). For deictic expressions, TİD uses the pointing signs HERE and THERE and the signing space, the space surrounding the signer's body. In addition to the use of the signing space and classifier constructions, TİD has many lexical signs such as LEFT, RIGHT, FRONT, BACK, IN, ON, UNDER, BETWEEN/IN-THE-MIDDLE/AT-THE-ZENITH, NEXT-TO/TOGETHER, ACROSS for static situations in which objects are stationary, and GO, STAY, HIT, CRASH, and sometimes WAIT/AT-REST for simple motion events in which at least one of the objects are in motion. Similar to the use of positionals or posture verbs such as standing, lying, sitting, and so on in the expressions of space in spoken languages (e.g., papers in Newman 2002), TİD can also use constructed actions in which signers imitate the actions and movements of an object or 'become an object' as observed in other sign languages, too (see Quinto-Pozos 2007).

An example is given below to explain the use of the signing space and classifier constructions.

(1)

MAN TWO   CL1_{vertical-two hands}-'STAND'

'Two men are standing and facing each other'

In (1), the signer uses the classifier CL1 after signing MAN TWO 'two men.' The classifier CL1 represents the torso and the rest of the body of the referent, the man. It shows that since the two hands were in use, there were two referents, two men. The ventral of the index finger encodes the orientation and the direction of the man, the front of the man. The fact that the two hands are stationary indicates that the two men are not moving in the event. One of the classifiers is on the left hand side of the signing space and the other one is on the right hand side of the signing space, indicating that one of the men in the event is on the left and the other one is on the right from the signer's perspective.

Previous studies have not dealt with the manner of motion in TİD with the exception of one study (Arik, 2010a) which investigated motion event descriptions in four sign languages: American Sign Language, Croatian Sign Language, Austrian Sign Language, and TİD. In this study, signers watched very short movies in which objects were in various spatial configurations and in motion. The results showed that regardless of language, signers encoded the path information of the motion. There was no description with manner only. Contrarily, path-only and path+manner encodings in the motion event descriptions varied across the four sign languages. TİD signers gave more path-only descriptions (in the 65.63% of all descriptions) than the other signers while Croatian Sign Language signers gave more path+manner descriptions (in the 63.39% of all descriptions) than the other signers.

3. Present study: methods

3.1. Hypotheses

There were two hypotheses of the current study.

Hypothesis 1: When a single event involves only manner of motion, manner is obligatorily encoded.

Hypothesis 2: In spatial event descriptions, orientations of objects are expressed more than locations of objects.

3.2. Participants

Eight deaf fluent signers of TİD (4 males, 4 females) participated in this study. The TİD signers graduated from schools for the deaf, were aged between 22-45, and were from Istanbul. They were paid for their participation. The data were collected at language labs at Bogazici University, Istanbul. All participants signed consent forms.

3.3. Design and procedure

A 2x2 within-subjects design was used in which Orientations (two animals facing each other or the same direction) and Manners of Motion (one of the animals either hopping or sitting) with no change in path were manipulated. Thirty-four short videos were created for this experiment. Each consisted of 4-5 photo frames put together in iMovie to create a motion picture video. Each video lasted 1-2 seconds. Of the 34 videos, the first 2 were warm-up items, 16 were experimental items (see Appendix for descriptions), and the remaining 16 were fillers. Experimental items and fillers were randomly ordered. Two scripts were prepared. In each script the first two warm-up items remained the same. The second script was the reverse order of the first script. In this way, the order effect was minimized. Each participant received only one script.

Video #4 in Fig. 1 and #22 in Fig. 2 are given below to illustrate the experimental testing items. In Fig. 1, the location is left-right, the orientation is facing each other, and the manner is hopping; whereas, in Fig. 2, the location and orientation are the same but the manner is sitting.
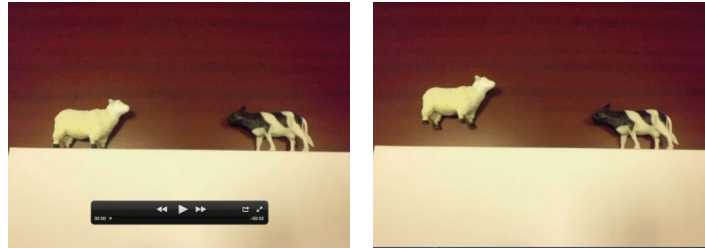

Fig. 1 There is a sheep on the left and a cow on the right, facing each other. The sheep hops twice.

Fig. 2 There is a goat on the left and a cow on the right, facing each other. The goat rears up twice.

Directions were given in TİD. The participants were asked to describe what they saw in the movie to an addressee. The addresses were native fluent TİD users for TİD participants. The participants were told that this experiment was not about memory or intelligence and there was no right or wrong answer. The participant and the addressee sat face-to-face. The videocamera was slightly behind the addressee. The videos were shown one-by-one on a laptop screen which was positioned in front of the participant. In addition to the pair, there was an experimenter in the room who showed the videos one-by-one in order. The participants were free to watch the video more than once if they wanted to. Whenever the participants asked for confirmation, the experimenter gave positive clues such as 'very good' or reminded them of the directions, 'there is no right or wrong answer.' Each session lasted about 15 minutes.

3.4. Coding

The TİD videorecordings were transcribed by a bilingual Turkish-TİD signer and coded by an assistant and the experimenter. A data set in TİD is also given below to illustrate the coding:

(2) TİD participant #1 describing the movie #4 in Fig. 1:

RH: COW   POINT _____
LH: POINT
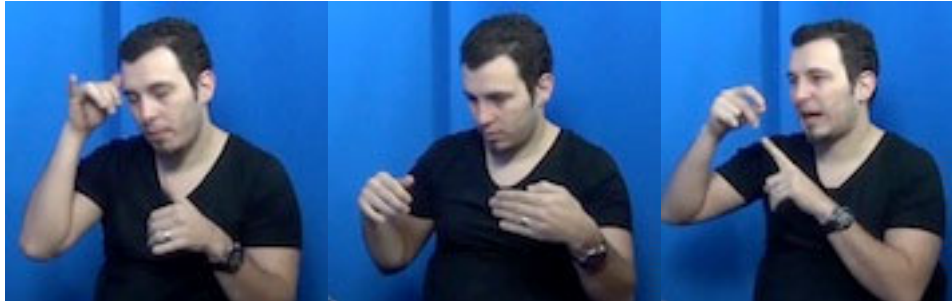

RH: STAY   POINT
LH: POINT   POINT   CL2$_{bend}$_____

RH:
LH: _____ up_____ $_{down}$_____(3 times)
'A cow is on the right, staying. On the left [something] is jumping three times'

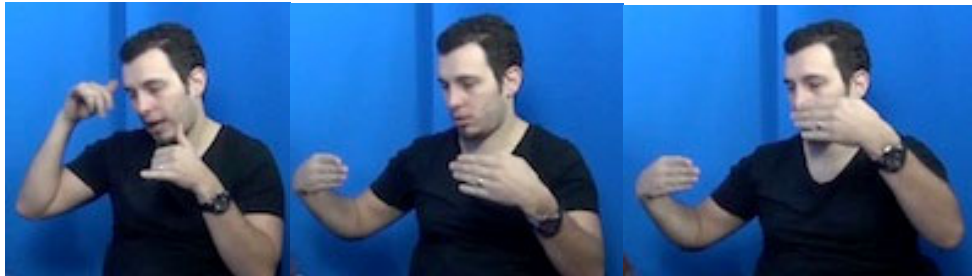(3) TİD participant #2 describing the video #4 in Fig. 1:

RH: COW   İ(fingerspelling)
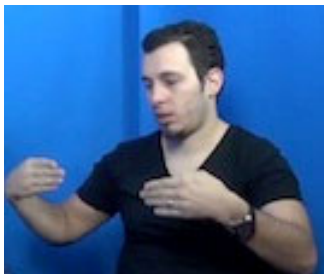LH: CLB$_{vertical}$ İ(fingerspelling)

RH: COW   CLB$_{vertical}$_____
LH: CLB$_{vertical}$_____ up _____

RH: _____ ____ _____
LH: _____ $_{down}$ _____(3 times)

'A cow [sic][=sheep] is on the left, facing right. The cow is on the right facing left. They are facing each other. The cow [=sheep] is jumping three times'

In (2) and (3), the locations and manners of the animals were encoded and directly reflected the event in the video. Therefore, they received 1 according to the binary coding system. In (3), the orientations of the animals were clear: they were facing each other as in the movie. Thus, (3) received 1, too, for the orientation according to the binary coding. However, in (2), the orientations of the

animals were ambiguous and were not encoded exactly. The addressee would thus not know whether the animals were facing each other or not. Therefore, (2) received 0 according to the binary coding system.

4. Results

There were a total of 128 video recorded expressions in TİD. These data were analyzed separately. Since the data were nonparametric and consisted of binary codings, a Cochran's Q test was conducted. If there was a statistically significant result, then a pairwise comparison was made using a McNemar test.

In their descriptions, the TİD signers used classifiers and signing space as well as the lexical signs HERE/THERE with pointing and FRONT/BEHIND. To encode manner, they also used constructed-actions, e.g. becoming a character in the motion event; yet, these were less common than classifier constructions. 99% of the descriptions contained the manner of motion. However, some participants encoded location, orientation, and the manner of motion event; some others gave location information but rarely orientation; yet, some others presented orientation but not location information in all of their descriptions. Moreover, a few of the participants relied on constructed actions more often than others.

A Cochran's Q test showed a significant difference in encoding Location (60.9%), Orientation (39.8%), and Manner (99%), X^2(2 N = 128) = 95.396, $p < .001$. Pairwise comparisons using a McNemar test indicated that Manner was described more than Location ($p < .001$) and Orientation ($p < .001$) across the board. Location was described more than Orientation ($p = .001$). This difference reached a significance level in the descriptions of 2 out of 4 type of manipulations: 1) animals facing the same direction, $p < .001$ and 2) animals sitting, $p < .05$.

A closer examination of the data revealed that for the hopping and sitting events, the TİD signers used two kinds of constructions: classifier constructions and constructed actions. The classifier constructions were mostly two kinds: $CL2_{bend}$ and $CLB_{vertical}$ as exemplified in (4) and (5), respectively.
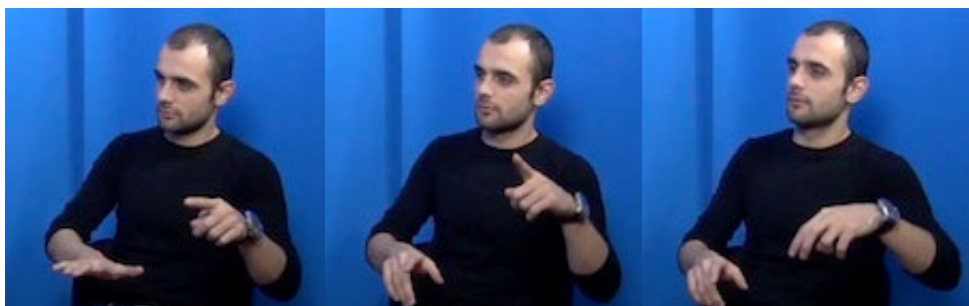
(4=2) TİD participant #1 describing video #4 in Fig. 1:
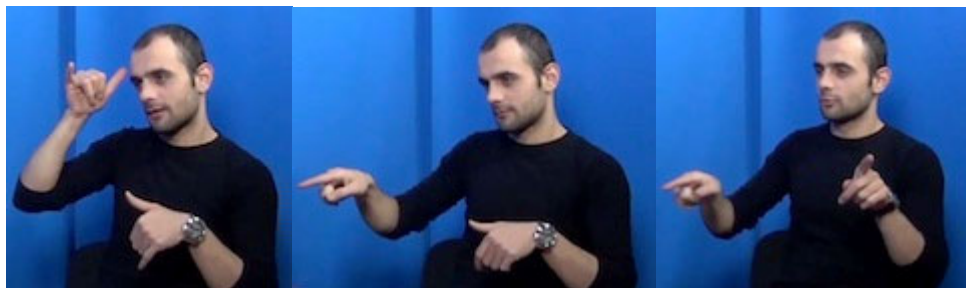
RH: COW   POINT _____

LH: POINT

RH: STAY   POINT
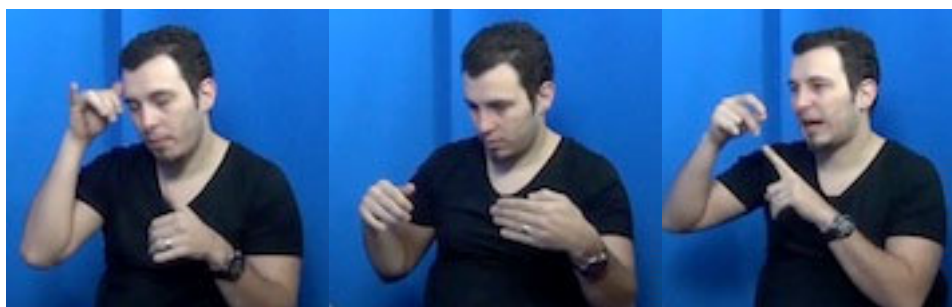LH: POINT   POINT   CL2_{bend}_____

RH:
LH: _____ up_____ down_____(3 times)
 'A cow is on the right, staying. On the left [something] is jumping three times'

(5=3) TİD participant #2 describing video #4 in Fig. 1:

RH: COW   İ(fingerspelling)
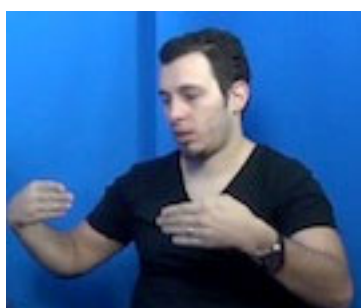LH: CLB_{vertical}   İ(fingerspelling)

RH: COW   CLB_{vertical}_____
LH: CLB_{vertical}_____ up _____

RH: _____ ____ _____
LH: _____ _{down} _____(3 times)
'A cow [sic][=sheep] is on the left, facing right. The cow is on the right facing left. They are facing each other. The cow [=sheep] is jumping three times'

In addition to classifier constructions, TİD signers used constructed actions, imitating an action of a character in the event, in some of their descriptions. In (6), the TİD signer imitated the hopping action (manner) of the sheep.

(6) TİD participant 4 describing video #4 in Fig. 1:

(…) CONSTRUCTED ACTION 'jump like this' (2 times)

While the orientations of the animals were expressed in 39.8% of all descript-ions, the locations of the animals were expressed in 60.9% of all descriptions. For example, in (5), the fingertips of the hands (CLB$_{vertical}$) representing the front of the animals were facing each other. The fact that the left hand represented the sheep which hopped twice and the right hand represented the cow which stayed stationary showed the locations of the animals exactly as they were in the video. It was also possible to encode the location but not orientation. For example, in (4), the signer located the animals on the left and the right of his signing space, but left their orientations ambiguous.

Both locations and orientations could be ambiguous in the TİD expressions. This could be done by using constructed actions, e.g., (6), where the signer took the roles of the animals and imitated their actions, and used lexical signs without using the signing space for locations. For example, in (7), the TİD signer used the lexical sign STAY for the cow to indicate the cow was stationary in the movie and the classifier CL2$_{vertical}$ to show the sheep's manner. In this description, the locations and orientations of the animals were ambiguous.

(7) TİD participant 5 describing video #4 in Fig. 1:
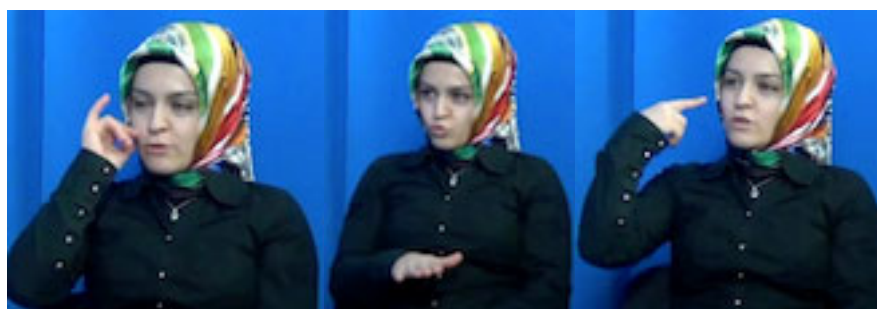
| RH: COW | STAY | SHEEP |

RH: CL2$_{vertical}$_____up_____down (2 times)

'A cow is staying. A sheep jumps twice'

5. Conclusion

This study investigated to what extent TİD users encode the manner of objects in basic motion events. Yet, until the current study, little was known whether language users encode manner when it is salient. The current study investigated this in TİD which uses visual-gestural language modality. Confirming Hypothesis 1, the results showed that regardless of modality, manner is obligatorily expressed when it is salient. Contrary to Hypothesis 2, TİD signers expressed locations more than orientations. Overall, these findings support previous research (Arik, 2008, 2009, 2010a, 2010b, 2011, 2012a, 2012b, 2013a, 2013b) which suggests that despite iconic motivations, signers (similar to speakers) do not express space entirely.

Although the current study provides evidence for this from a sign language, it is too early to suggest that this is a universal property of sign languages or human language and cognition in general. Therefore, the ongoing studies are currently being conducted on satellite-framed languages such as English and other sign languages such as American Sign Language to further investigate this issue. The ongoing studies are also being conducted on motion event expressions carrying both manner and path information not only in Turkish and TİD, but also English and American Sign Language.

Acknowledgments

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APPENDIX

Movie	Descriptions
4	There is a sheep on the left and a cow on the right, facing each other. The sheep hops twice.
6	There is a goat on the left and a sheep on the right, both facing right. The goat hops twice.
8	There is a cow on the left and a sheep on the right, facing each other. The cow rears up twice.
10	There is a donkey on the left and a cow on the right, both facing right. The cow rears up twice.
12	There is a sheep on the left and a cow on the right, facing each other. The cow hops twice.
14	There is a horse on the left and a bull on the right, both facing left. The bull rears up twice.
16	There is a goat on the left and a sheep on the right, both facing right. The sheep hops twice.
18	There is a goat on the left and a cow on the right, facing each other. The cow rears up twice.
20	There is a horse on the left and a cow on the right, both facing left. The cow hops twice.
22	There is a goat on the left and a cow on the right, facing each other. The goat rears up twice.
24	There is a bull on the left and a donkey on the right, facing each other. The bull hops twice.
26	There is a horse on the left and a bull on the right, both facing left. The horse rears up twice.
28	There is a donkey on the left and a cow on the right, both facing right. The donkey rears up twice.
30	There is a horse on the left and a cow on the right, both facing left. The horse hops twice.
32	There is a bull on the left and a sheep on the right, facing each other. The sheep rears up twice.
34	There is a bull on the left and a donkey on the right, facing each other. The donkey hops twice.

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