

Iconicity and conceptual metaphor in military hand signals*

Iksoo Kwon · Jung-Eun Lee*** · Jinree Jeon · Young-Eun Park**
(Hankuk University of Foreign Studies)

Kwon, Iksoo, Jung-Eun Lee, Jinree Jeon, and Young-Eun Park. 2016. Iconicity and conceptual metaphor in military hand signals. *Linguistic Research* 33(2), 319-347. This paper explores military hand signals as a type of non-verbal language modality. We show that this type of sign language involves a construal process that relies on, first, iconic, and second, metaphoric relationships between the thing signed and the gesture. Although they are, unlike primary sign language, used among non-deaf people with very limited inventory and involve very little reciprocity, military hand signals still provide another indicator of human cognition and conceptualization based on iconicity and conceptual metaphor. This paper thoroughly discusses a few hand signal examples from a US Army ROTC field manual and non-fiction military movie/TV show clips and provides systematic explanations of how iconicity and metaphor guide interlocutors to grasp the meanings conveyed by the signals as a non-verbal modality. Based on the analyses, this paper addresses characteristics of military hand signals especially on their form-meaning relationship and their status in the typology of gestures in general. (Hankuk University of Foreign Studies)

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1. Introduction

When people converse, speech sound is not the only medium they use to convey their intended messages; people also gesture. The non-verbal modality is utilized so

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** Iksoo Kwon: First author

*** Jung-Eun Lee: Corresponding author

unconsciously that language users generally would not be able to remember their gestures if they were asked to repeat them, while they would easily remember what they had spoken. This mnemonic asymmetry is also implied by the unlikeliness of a conversationalist asking an interlocutor to repeat what he or she had gestured during the conversation, whereas a request to repeat what one has said is normal (Sweetser 2007: 203).

The fact that gestures are neither conscious nor, apparently, significant enough to the interlocutors to be remarked upon, does not necessarily mean that they are of no use. They are as crucial as verbal modalities in that they enhance the natural flow of utterances. People would notice an awkwardness in a situation where two interlocutors, not on the phone, conversed with the complete absence of gestures. Unexpected gestures are also notable; for example, moving your hand downward while talking about a salary raise would seem strange to your interlocutor. According to McNeill (2005: 3), these observations indicate that gestures ‘are conceived of as ingredients in an imagery-language dialectic that fuels speech and thought’. Two experimental studies support McNeill’s claim. In the first, Krauss et al. (2000) had participants grasp the top of a chair while speaking; these participants had more difficulty with lexical access to spatial concepts than other participants who could move their hands while speaking. In the second, Bavelas et al. (1992) observed that telephone speakers unconsciously make iconic gestures while giving directions by phone, although they tend to make fewer discourse-regulating gestures than people who are speaking face-to-face.

These two studies’ findings indicate that ‘gestures, language, and thought are seen as different sides of a single mental/brain/action process’ (McNeill 2005: 3). That is, when gestures are co-timed with verbal modalities, gestures and verbal modalities stem from common idea units, and that is how we construe meanings that come originally out of the common idea units (McNeill and Duncan 2000:488). Scholars in the field of Cognitive Linguistics have paid attention to the ‘cognitive unconscious’ (Lakoff and Johnson 1999: 90) of gestures. It is commonly assumed within the field that language is closely related to mental imagery on which language users’ conceptualizations are based. Cognitive Linguistics research frequently visits the questions of how mental imagery is specified and realized along with its verbal correspondences (e.g., Damasio 1994; 1999, among others). Moreover, cognitive mechanisms that bridge the concepts of reference and motor actions such as iconicity

and conceptual metaphor (Lakoff and Johnson 1999) have received more and more attention as their crucial role in the cognition of gestures has come to be more widely acknowledged (Cienki 1998; Kendon 2004; McNeill 1992, 2005; Núñez and Sweetser 2006; Sweetser 2007; Parrill 2012).

In a similar vein, this paper explores military hand signals and the cognitive mechanisms that are involved in them. Military hand signals are interesting for the following reasons. First, military hand signals are a symbolic system that is utilized under special and specific circumstances: mostly, they are used in battles and drills wherein verbal modalities are strictly prohibited for reasons of stealth and security. Second, military hand signals are conventionalized to some degree and their inventories are limited compared to sign languages, whose inventories are full of arbitrary symbols. Third, the purpose of using this alternative type of gesture is not to conduct sophisticated interactive communication, but to convey a simple but crucially performative message (e.g., a command). Lastly, although they are somewhat conventionalized, military hand signals are understood based on mundane cognitive mechanisms such as iconicity and conceptual metaphors. These properties indicate that military hand signals are not a complete and fully recursive and productive system, as a sign language is, but a limited set of conventionalized symbols for a special context – military settings – but that they are nonetheless an interesting alternative type of gesture whose construal processes are based on the aforementioned cognitive mechanisms. Another motivation for this study is that hand signals in general have received very little attention of cognitivists let alone military hand signals have (for hand signals of crane driver guiders, see Brun (1969) and for sign language of sawmill workers, see Meissner and Philpott 1975). In this vein, this study contends that research on military hand signals is meaningful because it fills the gap.

This paper proceeds as follows: Section 2 discusses types of motivations for form-meaning relationship of gestures in general, which provides stepping stones to the actual analyses of military hand signals. In the following section, actual data are analyzed within Cognitive Linguistics frameworks such as conceptual metaphor, metonymy, and Force Dynamics semantics (Talmy 2000). Section 4 contains discussions of characteristics of military hand signals focusing on the motivations accounted for in them and on their status in the typology of gestures.

2. Relationship between form and meaning of gestures

In this section, we explore motivations accounted for in relationships of form and meaning of gestures before we proceed to analyze actual data. The categorization of gestures relies on what kind of cognitive mechanisms are involved in their form-meaning relationship. McNeill (2005: 38) claims that the relationship between gestures and their meaning can be motivated in four major ways: conceptual iconicity, metaphoricity, deictic representation, and representation of rhythms of verbal speech-acts. This sub-section explores these four relationship types because the main goal of this study is to look into what kinds of motivation — cognitive mechanisms — are involved in the form-meaning relationship of gestures, specifically military hand signals.

First of all, gestures for which the relationship between form and meaning is iconically motivated are called iconic gestures. Instances of this category represent a physical shape of an (abstracted and simplified) entity or an image of its movement: a dominant medium (most likely, a finger or hand) iconically draws physical properties of a referent. It is noteworthy, however, that not only the result but also the process of drawing matters in iconic gestures, because the process can also represent aspectual information of an event iconically. For instance, a fast car's movement is represented by the fast movement of the gesture in question. Iconic gestures are those presenting images of concrete entities and/or actions.

Gestures can also represent abstract images that are mapped onto concrete concepts. Regarding this category, the relationship between gestures and their corresponding concepts is motivated by conceptual metaphor. Conceptual metaphor (Lakoff and Johnson 1999) refers to a cognitive mechanism by which we understand one relatively more abstract concept ('target') in terms of another relatively concrete concept ('source'). Conceptual metaphor pervades not only the realm of speech, but also the realm of non-verbal communicative modalities. This is natural because conceptual metaphors pervade everyday life, which naturally involves gestures. Metaphoric gestures represent things and/or actions in the source domain (Cienki and Müller 2008: 484). For example, to express that one has an idea, one might gesture as if holding an object. This gesture is iconic in that the form of gesture resembles holding an object and also metaphoric in that holding an abstract idea is realized by the conceptual metaphor IDEAS ARE OBJECTS.¹ This particular metaphor is not

hard to find in verbal expressions, too, as in *hold that thought!*

The next type of gestures is based on its members' deictic nature. Deictic gestures can be instantiated by the following case: one extends the index finger, bending the others, and indicates a referent by moving the fingertip towards the target. The deictic gestures have their variants. For example, with both hands occupied by other work, one can use the head to indicate a target referent, thus making a variant for the deictic gesture of pointing with the typical medium of the index finger.

Lastly, there are some gestures whose sole purpose is to keep the rhythm of the accompanying speech. This repetitive type is called beats, and is usually made unconsciously while the speaker uses the verbal modality.

Among the four types of gestures, this study's research interest centers around iconic gestures and metaphoric gestures. Metaphoric gestures are of great interest because conceptual metaphor helps language users to construe abstract concepts as well as concrete ones. Conceptual metaphor thus is a good motivation for expanded functions of gestures (McNeill 2005: 45), which conforms to the fundamental assumption of Cognitive Linguistics that language use is tightly related to its accompanying image schema.

3. Cognitive mechanisms in military hand signals

This section analyzes military hand signals with a special focus on the conceptual iconicity and metaphoricity involved in their construals, leaving aside their deictic and conventionalized natures. Most of the military hand signals involve hand movement that serves to instruct the signer's interlocutor (i.e., the signee) to move in a certain direction (e.g., 'charge towards nine o'clock'); the direction of the hand movement corresponds to the direction of the future movement of the signee. For this reason, we consider deixis the basis of military hand signals, but this is not the main focus of the present work. Moreover, we do not discuss in detail another

¹ Gestural representations of abstract concepts are necessarily both iconic and metaphoric (McNeill 1992: 14). The distinction between iconic and metaphoric gestures is derived from the difference in the way gestures represent images. If it is used to represent images of concrete entities and/or actions, then the gesture is said to be 'iconic'. If it is used as a means of presenting an image which is to eventually represent an abstract idea, then the gesture is said to be 'metaphoric'.

extensively used type of military hand signal – the conventionalized ones, including the thumb-up sign meaning ‘all set’. Rather, this study is mainly concerned with the first two types of hand signals because their analysis will allow us to show how cognitive mechanisms work in the hand signals in a transparent way. The military hand signal data are taken from a US Army ROTC field manual and non-fiction military movies/TV show.²

3.1 Iconic hand signals and conceptual metonymy

Military hand signals whose form-meaning relationship is iconic are motivated by conceptual metonymy, that is, referring to a target entity by indicating something else that is related to it (Lakoff and Johnson 1980). In the sentence *The ham sandwich is waiting for his check* (Lakoff and Johnson 1980: 35), for example, the seemingly non-sentient noun *the ham sandwich* is used to refer to the person who ordered it. Technically, the iconic properties of military hand signals cannot be fully grasped without recourse to the mechanism of conceptual metonymy: military hand signals are constrained by the physiology of the signers, who would find it difficult to represent, using only their limbs, detailed images of whole target referents and/or their actions (Ahrim Kim, p.c., September 2013). In a sense, military hand signals are natural consequences of the tendency of signers to attempt to represent a whole by depicting its most salient part.

The first example is a series of movie clips excerpted from *Saving Private Ryan*, where a scout (i.e., the signer), who is on high ground (a high tower), informs the officer (i.e., the signee) of the type and the number of enemies. Before this scene, the signer used his gun to deictically indicate the direction from which the enemy was coming.

² For the US Army ROTC field manual, go to <http://armyrotc.missouri.edu/pdfs-docs/Forms/handarmsignals.pdf>. The video clips are from <Saving Private Ryan>, <Band of Brothers - Episode 2>, and <Black Hawk Down>. Considering that the movies/TV show had a military specialist as an advisor (Mr. Dale Dye), we will assume that its representation is accurate.



Figure 1.1 'see'



Figure 1.2 'Tiger tank'



Figure 1.3 'two'



Figure 1.4 'infantry'



Figure 1.5 'squad'
or 'ten'



Figure 1.6 'five'
or 'ten'

In Figure 1.1, the signer points at his eyes with index and middle fingers to denote the verb *see*. This is a clear case wherein conceptual metonymy motivates the form-meaning pair, because one entity (i.e., 'eyes') is used to express another (i.e., 'see') that is conceptually associated with it — obviously, eyes are used to see a stimulus. Then, the scout proceeds to report that what he saw is a 'Tiger tank.' He faces his right hand palm down and raises the stretched hand horizontally. At the same time, he raises his left hand vertically with its palm facing right. The two hands together represent the first letter, 'T', in 'Tiger tank' (Figure 1.2). Next, he iconically and conventionally represents 'two', the number of Tiger tanks, with two fingers outstretched (Figure 1.3). It is noteworthy that the sequence of gestures in Figures 1.1 and 1.2 iconically represents the verb-object order in English: '(I) see Tiger tanks'.

In Figure 1.4, the signer raises his right hand, bent down at the wrist with the fingers all pointing down, to represent 'infantry' (i.e., soldiers who fight on foot). The hand signal is iconic; the signer's downward-pointing fingers iconically represent

the legs of standing soldiers. The limbs that are directed downward are the most salient element of the motor-action, i.e., walking, evoked by *infantry*. Notice that the signal does not just represent a part (i.e., legs) to indicate a whole (i.e., infantry), but rather picks out the most salient feature of the infantry, namely, walking, which involves the use of legs. Finally, the signer shows a clenched fist to represent ‘squad’ or ‘ten’ (Figure 1.5), and spreads out all the fingers to express ‘five’ (Figure 1.6). The gestures in Figures 1.4-1.6 therefore indicate that the enemy force is made up of 50 infantry soldiers.

Unlike the examples discussed so far, there are gestures that are not only iconic but also deictic. Figure 2 shows a series of still shots from the movie *Black Hawk Down*, where a U.S. Special Forces soldier uses hand signals to command another soldier to begin a rear attack.



Figure 2.1 ‘Strangle’-onset



Figure 2.2 ‘Strangle’-coda



Figure 2.3 ‘You’



Figure 2.4 ‘Proceed’-onset



Figure 2.5 'Proceed'–continue



Figure 2.6 'Proceed'–coda

In Figures 2.1 and 2.2, the signer lifts his clenched fists and crosses them at the height of his neck, and then rapidly brings them down in a diagonal direction, drawing the shape of a letter 'X'. After this strangling gesture, the signer points to the signee deictically with his index finger (Figure 2.3) and commands him to proceed towards where the enemies are located (Figures 2.4–2.6). The signer brings his fingers together (Figure 2.4), then opens the gap between the thumb and the four fingers (Figure 2.5). While repeating the opening-and-closing gestures slowly several times (three times, in the movie), he moves his hand towards the destination (Figure 2.6). This series of hand signals reads, '(I) will strangle the neck (of the enemies), so you proceed towards them carefully (in order to draw their attention)'.³ Here, the hand signals of pointing at the interlocutor and pointing at the destination are deictic in nature. Also, the speed at which the signer's hand moves, which is slow, is iconic of the signee's future careful and slow movement towards the enemies. Such slow repetition of gestures represents the aspectual information of the conveyed meaning, which is 'proceed carefully'.

One of the interesting points here is the ordering of the gestures. The meaning conveyed by the series of hand signals consists of two parts — the event of the signer's assault on the enemies, and the event of the signee's proceeding towards the enemy. The temporal order of these two events is critical for successful execution of the operation. If the signee understood the order of the two events as reversed, '(I) will strangle the neck (of the enemies), *then* you proceed to them carefully', it would have radically different consequences. Hence, the ordering of the events represented in this series of hand signals represents the signer's future commitment first rather

³ The meaning of 'to draw the enemy's attention' seems to be shared tacitly between the participants because it is accessible based on their common ground in the given context.

than representing the temporal order in an iconic fashion.

A hand signal whose form-meaning pair is motivated both iconically and deictically is shown in Figure 3, with two shots excerpted from a TV show, *Band of Brothers*. In this scene, the soldier waits in ambush, and at the right time, he gives a command to his men to commence firing a machine gun towards where the enemies are located.



Figure 3.1 'Commence fire'– onset



Figure 3.2 'Commence fire'– continue

In Figure 3, the signer's palm is open and his fingers are stretched out straight and held close together; he moves his forearm to point his fingertips in the direction towards which the soldiers are supposed to fire (i.e., where the enemies are). He keeps his elbow fixed and moves only his forearm. He rapidly and repeatedly moves the forearm up and down. This series of actions is clearly deictic in nature: the signer directs his men's attention to the direction in question by using his fingertips. In other words, the signer conveys the meaning regarding the target direction by indicating the specific direction in physical space.

The repetition of the gesture in Figure 3 is also motivated by its iconic nature. Firstly, the repetition represents the aspectual information of the firing event: the gunshots must be done rapidly and incessantly. This rapidness and continuity are embodied in the form of the gesture as it is performed in a speedy and continuous fashion. That is, the aspectual iconicity is reified into the formal properties of the gesture. Secondly, the signer not only moves his forearm, but repeatedly and

intensely shakes it, as if he sprays something off his hand by shaking it hard. This is also motivated by the gesture's iconic property since the motor action depicts a process wherein multiple trajectors are separated off as they are launched from their source. In this respect, this gesture is iconic of the movement of the machine gun's multiple bullets separating from the magazine as they are shot at the enemies.

As mentioned above, the hand signals used in the military are characterized by their deictic nature, because it is important for the interlocutors to indicate the direction of the instruction and the signee's movement. In addition, because signers can hardly represent the whole shape of the target entity with only the hands, it is natural that these gestures typically embody only the most salient property of the entity to which they refer. This being so, the iconicity in the form-meaning relationship of hand signals is locally construed, and the signals are naturally motivated by conceptual metonymy, in which by definition a target concept (a whole shape/concept of an entity) is referred to by indicating something else that is related to the target (the most salient property of the target).

3.2 Metaphoric hand signals

Another important type of gesture employed in military hand signals is metaphoric gesture. Conceptual metaphor is the understanding of one kind of thing in terms of another (Lakoff and Johnson 1980, 1999). It is not just restricted to linguistic phenomena; conceptual metaphor is widely accepted to be an important cognitive mechanism that constructs and affects the human conceptual system. It is thus assumed that conceptual metaphor functions as one of the principal cognitive mechanisms that build relationships between a referent and a gesture representing it.

Examples of gestures whose construal involves conceptual metaphor are not difficult to find. Figure 4 is one of the hand signals listed in the US army field manual, which conveys the message, '(while running) slow down and walk at a rapid pace'.



Figure 4. 'Slow down'

The hand signal in Figure 4 is made as follows: the arm extends horizontally sideward, palm to the front; the arm waves slightly downward several times, remaining straight. The relationship between the form and meaning of this hand signal can be explained by a primary metaphor LESS IS DOWN. Many primary metaphors based on fundamental human experiences and functioning as cognitive mechanisms have been established by scholars (Grady 1997: 242); one such metaphor is MORE IS UP, LESS IS DOWN. The hand signal represented in Figure 4 is closely related to this metaphor. The metaphor MORE IS UP, LESS IS DOWN frequently occurs in verbal communication as well; for instance, *prices go up rapidly*, *stakes are high*, and various kinds of things can *hit rock bottom*. The concept of QUANTITY can be easily understood by using the concept of VERTICALITY. However, to fully account for the signal in Figure 4, another pervasive mechanism needs to be considered, because the gesture also conceptualizes SPEED as QUANTITY. Semantic binding resolves the puzzle: the scale of the SPEED is conceptually mapped onto that of the QUANTITY, thus reaching the eventual meaning indicated in Figure 4, 'slow down.'

In Figure 4, the signer represents the meaning of 'down' in terms of the concept VERTICALITY by stretching out his arm with the palm to the front and repeatedly moving the whole arm downward from its onset position. In the conceptual metaphor LESS IS DOWN, the concept of VERTICALITY in the source domain is mapped onto the concept of QUANTITY in the target domain. In this conceptual structure, language users understand 'less quantity' in terms of the concept of 'lower location'. It is worth mentioning that there are some stipulations clearly marked in the field manual: the signer must not move the arm upwards while performing this signal's action; the gesture can be used when conveying a message of 'slow down' to the

driver of a truck or other means of transportation. The gesture of moving downward in Figure 4 thus means reducing the amount of some entity, that is, a conceptually measurable concept such as speed.

Figure 5 is another example of a metaphoric hand signal, which means ‘assemble’.



Figure 5. ‘Assemble’

The signer of the given hand signal orders the signees to assemble at the designated place by raising an arm vertically overhead with the palm to the front, and moving it in a large, horizontal circle. This signal is normally preceded by a signal indicating the assembly or rally site. What is interesting here is that the signer draws a circle in order to convey the meaning ‘assemble’. Similarly, in American Sign Language and Korean Sign Language, the gesture for ‘group’ is to draw a small circle in front of one’s torso.⁴ The fact of these three signs with similar meanings in three different communication systems indicates that there is a conceptual relationship between the meaning of ‘assemble’ and the gesture of drawing a circle.

The form-meaning relationship of the hand signal can be explained by means of a conceptual metaphor, ASSEMBLIES ARE CIRCLES. The signal depicted in Figure 5 shows that the concept of ASSEMBLY is understood in terms of the concept of a CIRCLE. The conceptual mappings in this metaphor system are illustrated in Figure 6.

⁴ Source: American Sign Language Browser, Michigan State University (<http://aslbrowser.commtechlab.msu.edu/browser.htm>), Dictionary of Korean Sign Language. National Institution of Korean Language (<http://222.122.196.111/>)

Source domain		Target domain
Center of a circle	—	Gathering site
A geometric point	—	A member
Area of a circle	—	Members who gather
Size of the area	—	The number of members

Figure 6. Conceptual mappings of the metaphor ASSEMBLIES ARE CIRCLES

The first element constituting the metaphor ASSEMBLIES ARE CIRCLES is the gathering site in the target domain. When the members of a certain group physically assemble in one place, there always exists a certain spatial zone for the gathering: as the number increases, the zone expands. The expansion entails that there exists a specific zone that plays the role of the original starting point and such a zone in an assembly is conceptualized as the center of a circle in the source domain.

The second element is a member of an assembly. It is conceptualized as one geometric point. Members of an assembly are conceptualized as geometric points that form a circle, and the members who gather are conceptualized as the area of the circle.⁵ Other elements are also accessible: when a certain group of people assemble, for example, members and non-members of the assembly are naturally differentiated. Hence, it can be inferred that the non-members, in contrast to the members of the assembly, are evoked as unnoticeable base elements.

There are also verbal instances of the metaphor ASSEMBLIES ARE CIRCLES in English and Korean, as shown in (1).⁶

- (1) a. She's well known in *theatrical circles*.
 b. I *rounded up* a few friends for a party.
 c. A crowd *drew round* the winner.
 d. They are very lively characters with *a large circle of friends* within the school.

⁵ There is also another possibility for the dimension of a circle. If it is considered a one-dimensional figure, the gathered members of the assembly are conceptualized as a line, not an area. Because such an analysis is not appropriate, the concept of the circle in this metaphor system is considered a two-dimensional figure.

⁶ In the Korean examples (e - f), the 'circle/round' meaning is not transparent, as it is in the English examples, because the literal meaning of the morpheme *tan* 'to be round' is hardly inferred in everyday conversation.

- e. *ciptan-uy iik-ul wuyhae hayngtong-ha-ta.*
 group-gen benefit-acc for act-do-dec
 ‘(I) act for the benefit of the group.’
- f. *ku-nun simin.tanche-y sosoktoy-e hwaltong-ha-koiss-ta*
 he-top civic.group-loc belong-conn activity-do-prog-dec
 ‘He belongs to a civic group and is working (for it).’

In (1a), the word *circle* does not mean the geometric shape, but a group of people with a shared profession, interest, or acquaintance. Hence, *theatrical circles* in (1a) indicates a group of people with a shared profession, interest, or acquaintance involving the theater. In (1b) and (1c), the idioms with the word *round*, *round up* and *draw round*, mean ‘to bring together a number of entities (here, people) in one place’. In (1d), a number of friends are expressed as *a large circle of friends*, which shows the conceptual correspondence between the number of friends and the size of the area of the circle. In Korean, as shown in (1e) and (1f), the Sino-Korean morpheme *tan*, of which the meaning is ‘to be round’, occurs in the words *ciptan* and *tanchey*, both of which mean ‘a group’. These examples indicate that the concept of ASSEMBLY and the concept of CIRCLE are closely related in our conceptualization.

The fact that verbal instances of the metaphor ASSEMBLIES ARE CIRCLES are not hard to find indicates that this conceptual metaphor is pervasive in our everyday lives. In this respect, it is not surprising that the cognitive mechanism affects and motivates gestural form-meaning pairs as well as verbal modalities.

The following figures show the hand signal meaning ‘cease fire’ and the conceptual directionality involved in the signal.



Figure 7. 'Cease fire'

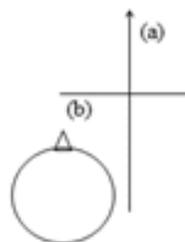


Figure 8. Directionality of the signal

The hand signal in Figure 7 goes as follows: the signer lifts his arm up, folds his elbow so that the forearm can be held in the vicinity of his eyes, stretches out his hand with its open palm facing forward, and repeatedly moves the forearm up and down in front of his face. The gesture reads 'cease fire'.

The motion seems similar to an action of cutting off something long. This hand signal is motivated by a metaphor *SUCCESSION IS A LINE*, which can be regarded as part of a superordinate metaphoric system *TIME IS SPACE* (Lakoff and Johnson 1999: 139) in which temporal concepts are understood in terms of spatial concepts. The concept of *SUCCESSION* in fact relies on the relative temporal order between a series of events; the temporal succession is conceptualized as a *LINE*, which comes from the space domain. Lakoff and Johnson (1999: 154-155) discuss the tight conceptual relationship between *TIME* and *SPACE*: *TIME* is conceptualized and understood in terms of a spatial concept, and a series of events are considered to be located in the temporal 'space'. A conceptual metonymy *EVENT FOR TIME* is of great relevance as well here. Take, for example, the sentence *The Kronos Quartet Concert is approaching*. The time when the event occurs is indicated by referring to the event itself, and the time is understood as a moving entity. The conceptual mapping of this metaphor and its implications are as follows:

<u>Source domain</u>		<u>Target domain</u>
A point	—	An individual event
A line	—	Succession of event
A starting point	—	A starting event
An end point	—	An end event

Figure 9. Conceptual mappings of the metaphor SUCCESSION IS A LINE

The target domain, which is the concept to be understood, is SUCCESSION, which consists of a series of events. The source domain is a LINE that is composed of a series of points. The starting event and the end event that constitute the concept of SUCCESSION in the target domain are mapped onto the starting point and the end point in the source domain. This cognitive mapping implies that the individual events occurring continuously must be the same type of event because the points, mapped onto the individual events, all seem equivalent to each other. When these individual events do not occur anymore, the line formed by the points does not extend anymore in the source domain, and the succession ends in the target domain. That is, the discontinuity of the line is conceptually understood as the end of the succession. To represent this discontinuity, the signer in Figure 7 ('cease fire') makes a gesture that vertically crosses the direction of the 'line' of repeated events.

As Figure 8 shows, based on the metaphor TIME IS SPACE and the EVENT FOR TIME metonymy, the series of repeated events (firing) is conceptualized as a line extending towards the enemies, as represented by line (a). When the signer employs the hand signal in Figure 7, the gesture, represented by line (b) in Figure 8, is in vertical relation with the continuous line of the event (firing). In Figure 8, the signer's front is represented by schematic representation of the signer's nose (the pointed triangular shape of the signer's head in the figure). Therefore, the conceptual structure of cutting the continuous line of (a) with the repeated motion of (b) stands for the command 'cease fire'. The metaphor SUCCESSION IS A LINE is not restricted to the construal of hand signals. Its verbal instances are numerous in both English and Korean; some examples are given in (2).

- (2) a. An old lady *cut in line* and no one stopped her.
 b. The electricity has been *cut off*.
 c. *pesu cenglyucang-ey salam-tul-lo cwul-i*
 bus station-loc people-pl-ins line-nom
kkunh-i-m-epsi iecy-e-iss-ta
 cut-pass-nomi-without be.connected-conn-exist-dec
 ‘There is a continuous line of people at the bus stop.’
 d. *swusipnyen-kan iecy-e o-n*
 decades-for be.connected-conn come-imprf
centhong-i kkunh-ecy-ess-ta
 tradition-nom cut-pass-ant-dec
 ‘The several decades of tradition were broken.’
 e. *inho-nun choykun myech nyen-kan tampay-lul*
 Inho-top recently several year-for cigarette-acc
kkunh-ci mos-ha-ko iss-ta
 cut-conn neg-do-prog-dec
 ‘Inho has not been able to break off smoking in recent years.’

Example (2a) shows that the phrase *cut in line* can be understood by conceptualizing a succession of people as something that can be cut. In (2b), the continuous supply of electricity is conceptualized as a series of events – linear events – and the suspension of the supply can thus be expressed as ‘cut off’. In Korean, (2c) similarly shows that a group (line) of people moving slowly towards a common destination is conceptualized as a ‘line’ and understood as an object that can be cut. In (2d), the event of preserving tradition occurred during a certain period, and the repetition of the event and its progress were conceptualized as ‘continuing a line’. In (2e), Inho’s habit is conceptualized as a ‘line’, and understood as something that can be ‘cut’.⁷

Figure 10 shows a metaphoric hand signal that conveys the meaning ‘ready’, with which the signer commands the signee to hold him/herself in readiness to

⁷ Interestingly, *kkunh-* cannot be replaced by another ‘cut’ predicate *calu-* in the Korean examples (c-e). *Kkunh-* has a semantic constraint that it should have as the object of separation a line, a linear object, or a longish object, whereas *calu-* does not. This lexical distinction supports the notion that succession is also conceptualized as a linear concept in Korean.

execute an action.⁸



Figure 10. 'Ready'

The hand signal consists of consecutive phases: the signer extends the arm towards the person being signaled, then raises the arm slightly above the horizontal, palm-outward. This signal tells the signee that he or she must be ready to act. The form-meaning relationship relies on the EVENT STRUCTURE metaphor (Lakoff and Johnson 1999), where causation is understood in terms of forced motion (or 'force dynamics'; Talmy 2000). Through the metaphor, various notions such as states, changes, and causes are conceptualized cognitively in terms of space, motion, and force; for example, a state is seen as a bounded region, a change in state is seen as movement into or out of this region, and causes are seen as forces. In force-dynamics terms, moreover, forced motion invokes a force dynamic situation in which an Agonist (a focal force entity) and Antagonist (an element opposing it) interact with respect to force.

The signal in Figure 10 iconically represents the action of the Antagonist against the Agonist: the signer's gesture with his palm facing outward corresponds to the action of the Antagonist who blocks the Agonist's abstract movement. Of the several phases such as 'ready - start - ongoing - done', which constitute one event structure, abstract movement here indicates 'to proceed to the next phase'. This signal is used for a person (i.e., signee) who is on the cusp of a phase change from 'ready' to 'start'. The force-dynamic involved in the signal in Figure 10 can be diagrammatically represented as shown in Figure 11 (after Talmy 2000: 418).

⁸ The signal in Figure 10 also conveys the meaning 'I am ready' or 'I am ready to move'.

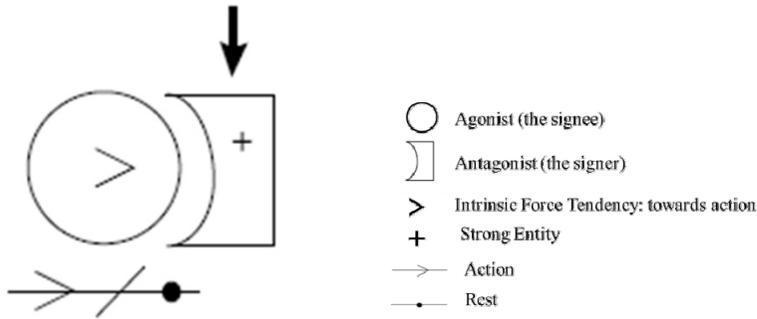


Figure 11. Force dynamics in the hand signal meaning 'Ready'

The stronger Antagonist (the signer) comes into position against an Agonist (the signee) with an intrinsic tendency towards motion, and thus causes it to change from a state of motion to one of rest. It is noted, however, that the motion here is metaphorical as in *CHANGES ARE MOTIONS*: it does not indicate the signee's physical motion, but rather a change in the signee's course of action (see below). The arrow above Antagonist in the figure indicates the Antagonist's motion into impingement, which metaphorically represents that the signer signals to the signee to be ready. The result of the force interaction is represented as the line beneath the Agonist, and the slash on it separates the states of the Agonist before and after the interaction, i.e., action and rest, respectively. This suggests that the signee stops proceeding with an action, and comes into a state of readiness, because of the signal of 'ready'. Because the force of the Antagonist (the signer) is conceptualized as the cause of the change in the state of the Agonist (the signee), the metaphor *CAUSES ARE FORCES* is involved here: the source domain of *FORCES* is mapped onto the target domain of *CAUSES*. The metaphor also occurs in verbal expressions such as *Hearing that lecture threw me into confusion* and *Pull him out of his depression*. The conceptual mapping of the *CAUSES ARE FORCES* metaphor involved in the signal of 'ready' can be represented as in Figure 12.

<u>Source domain</u>	—	<u>Target domain</u>
A physical entity (Agonist)	—	A signee
A physical force (Antagonist)	—	A signer (or his/her speech act)
Motion of agonist	—	A signee's 'moving on to' the next phase to execute an action
Rest of agonist	—	A signee's ready state
Destination of motion	—	Purpose of the action

Figure 12. The CAUSES ARE FORCES mapping in the hand signal for 'Ready'

The metaphor maps the elements in the source domain of FORCES onto the elements in the target domain of CAUSES. The signee who receives the signal of 'ready' in the target domain corresponds to the physical entity (i.e., Agonist) in the source domain, and the signer (more accurately, his/her speech act of 'ready'), the physical force opposing it (i.e., Antagonist). The motion of the Agonist in the source domain maps onto the signee's 'moving on to' the next phase in the target domain, which is the start state to execute an action, considering that the signal is used when the signee is turning the ready state into the start state. The rest of the Agonist in the source domain maps onto the signee's ready state in the target domain. The motion of the Agonist ends up at a destination which, therefore, corresponds to the purpose of an action. Based on the conceptual mappings shown in Figure 12, the inference patterns in the source and target domains can be summarized as shown in (3a) and (3b) respectively.

- (3) a. There are the physical entity (Agonist) and the physical force opposing it (Antagonist). The stronger Antagonist comes into impingement against the Agonist, which tends towards motion and has been moving to a destination, and thus stops it: the Agonist comes into rest. The state of the Agonist is shifted from a state of motion to one of rest, which results because of the impingement of the Antagonist, and would otherwise not occur.
- b. There are the signee and the signer. The signer sends the signal of 'ready' to the signee, who proceeds to initiate an action to achieve the goals of the action; thus, the signee comes into readiness. The

state of the signee is shifted from the state of ‘moving on’ to the state of being ready, which is a result of the signal of ‘ready’, and would otherwise not occur.

To understand the relationship between the signal in Figure 10 and its meaning ‘ready’, the key is to understand the entailment of the metaphorical correspondences shown in (3). The motion of the Agonist is stopped because of the Antagonist, which corresponds to the fact that the signee does not proceed to the next phase from the ready state, because of the command given by the signer. This conceptual scene is reflected in the signal shown in Figure 10. The signer’s gesture with his or her palm facing outward represents the Antagonist against the Agonist, which indicates ‘Do not move to the next phase (of initiating an action)’ and, consequently, asks the signee to standby. It is via the conceptual mapping shown in Figure 12 that the signal in Figure 10 conveys the intended message.

4. Discussions: Characteristics of military hand signals

First of all, how can we characterize the relationship between the forms and meanings of military hand signals? The relationship of forms and meanings of this category is, in fact, motivated by iconicity and metaphoricity. For example, as we have seen in Figures 3.1 and 3.2, when one moves his forearm repeatedly to point his stretched fingertips in the direction towards enemies, the hand signal is iconic in that its speed and continuous manner represent the aspect of the movement; it is also deictic in that it conveys the direction of the intended movement, which the participants can access in the given context. In an example of a metaphoric military hand signal (Figure 4), the signer moves a forearm, which is extended horizontally, up or down; upward movement indicates a larger number of speed; downward movement, a smaller number. Thus, the signal in question is metaphoric in that the concept that the signal represents is based on conceptual metaphors such as MORE IS UP and LESS IS DOWN.

Second, where can we put military hand signals in a typology of non-verbal modalities? To what degree gestures contribute to the overall construal of meaning in an interaction is the key factor that matters for answering this question, given that

non-verbal modalities and verbal modalities stem from a common knowledge package. McNeill (1992, 2005) classifies non-verbal modalities into five types depending on how they relate to verbal modalities: gesticulation, speech-linked gestures, emblems, pantomime, and sign language. He argues that they form a continuum because they overlap, just as other types of linguistic categories do (to be illustrated below). The continuum formed of the five types of gestures, so-called Kendon's continuum, is shown in Figure 13 (based on McNeill 2005: 7).

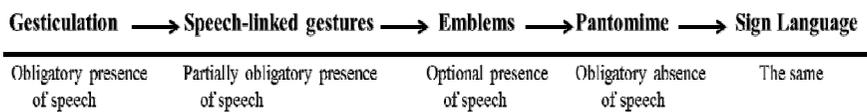


Figure 13. Kendon's continuum: relationship to speech

'Gesticulation' refers to any embodied non-verbal modalities that are co-timed with the accompanying speech. The members of this category are not confined to the motions of limbs, but include any meaningful motor action; for example, one can indicate a referent using head orientation or eye gaze when both hands are occupied by some other function. Instances of gesticulation vary even more in the sense that their meaning is to some degree generated by their pairing with verbal expressions in a variety of combinations; 'Speech-linked gestures' refers to a non-verbal modality that replaces some part of verbal expression. Gesticulations conspire with verbal expressions, taking place at the same time, to achieve a common communicative goal, whereas speech-linked gestures are parts of sentences themselves. For example, by producing 'Sylvester went [gesture of an object flying out laterally]' to depict a situation wherein the cartoon character moved in a certain manner, a speaker performs a speech act in both modalities; 'Emblems' function to make references to conventionalized concepts.⁹ This type can be instantiated by the so-called 'OK' sign: the thumb and index finger are bent and their tips are in contact, while the other fingers are extended. As is usual in conventionalized signs, the forms and meanings of an emblem are in arbitrary relationship; 'Pantomime' presents a narrative structure with only non-verbal modalities. It consists of a series of gestures made for the

⁹ This type has been characterized in various ways: symbolic (Efron 1972: 96), semiotic (Bakarat 1969), formally pantomimic (Wiener et al. 1972), autonomous, (Kendon 1983), and quotable (Kendon 1992) (all cited in Kendon 2004:335).

purpose of depicting/narrating a story, and it is characterized by involving no speech modality at all; lastly, ‘sign language’ is an alternative language system that is used by a speech community of which, typically, most or some members do not hear and/or speak. It has its own basic units such as phonemes and morphemes, and the basic units constitute grammatical patterns such as phonological articulation, morphological patterns, syntactic constructions, and so on. Independent of verbal language, sign languages are autonomous systems that evolve as any language does. Starting from gesticulation, the degree to which verbal modalities must be obligatorily performed to successfully achieve a communicative goal decreases. In other words, as we go to the right on the continuum, the degree of autonomy of the choreography of a series of motor activities increases (McNeill 2005: 5).

On the continuum, military hand signals seem to be similar to the category of emblems because they are to some extent conventionalized, just as symbolic emblems are.¹⁰ What is meant by ‘conventionalized’ here is that the forms are obligatorily required, the representations are arbitrary and culture-specific, and the meanings must be prespecified regardless of the context (McNeill 2005:48). For example, the ‘OK’ sign requires a specific set of fingers (i.e., the thumb and index finger); and, while it functions as an affirmative message/response in Western cultures, it is an insult in Northern Africa. However, military hand signals are conventionalized to a much lower degree than are emblems. The main reason for this situation is that the community that shares military hand signals is much smaller than the community that shares commonly used emblems in everyday life. Military hand signals thus do not belong to the symbolic emblem category, although they are more or less based on arbitrary relationships between forms and meanings.

Military hand signals also seem to behave similarly to sign language in that, because their intent is to communicate silently, they are usually used without any corresponding verbal expressions. In addition, as sign languages do, military hand signals have an inventory of conventionalized signs. Sign language is, however, an

¹⁰ This study assumes that to discuss where to put military hand signals on the continuum is worth looking into because military hand signals also make another type of form-meaning pair made by hands and there is no clear-cut boundary among types of gestures in general. Moreover, as this paper indicates, the military hand signals are sophisticated mixture of various types of gestures. In this vein, even though the authors are well aware that there is a line of work which assumes that the continuum has nothing to do with the military hand signals (e.g., Kendon 2004), this paper intends to pursue an answer for the question about typological status of military hand signals.

alternative language system that is equipped with phonological, morphological, and syntactic structures, whereas systems of military hand signals are not; they are not as conventionalized and sophisticated as sign languages are. The inventory of military hand signals is limited and does not have a language-like contrastive system. Moreover, military hand signals do not, in general, have syntactic potential (an exception has been discussed in section 3.1).

In sum, military hand signals are mixtures of functional properties found in various types of gestures such as emblems and sign language. Such a mixture is not surprising because, as McNeill (2005) convincingly argues, the various types of gestures form a continuum with no clear-cut boundaries between them.

5. Conclusion

This paper explores US military hand signals as a type of non-verbal modality, based on signals depicted in the US Army ROTC field manual and non-fiction military movies/TV show. Specifically, we showed how cognitive mechanisms — conceptual iconicity and conceptual metaphor — are involved in the form-meaning relationships of such signals. Military hand signals are noteworthy for another reason: their functional properties are mixtures of those characterizing various types of gestures. As to their relationship to verbal modalities, they share some properties with emblems and sign language because they are to some extent conventionalized and are mainly used without speech. As to the relationship between the forms and meanings, on the other hand, military hand signals are motivated by iconicity and conceptual metaphor, and deixis can be considered their basic feature.

It is widely assumed in Cognitive Linguistics that language is closely related to mental imagery, which is the basis for the conceptualization of language users, and that mental images are specified and realized along with verbal expression. Moreover, considering that gestures and verbal expressions stem from common idea units, gesture would be the most effective means of representing iconic image schemas and/or the conceptual imagery of its users. Drawing on this fundamental assumption, this study showed that cognitive mechanisms such as iconicity and conceptual metaphor are involved not only in gesticulation, but also in military hand signals that are mostly used without verbal correspondences. The study therefore

supports the claim (Cienki and Müller 2008:484, Núñez and Sweetser 2006, McNeill and Duncan 2000) that cognitive mechanisms play a role not only in verbal modalities, but also in non-verbal modalities.

Abbreviations

acc: Accusative ant: Anteriority conn: Connective dec: Declarative
gen: Genitive imprf: Imperfective ins: Instrumental loc: Locative
neg: Negativizer nom: Nominative nomi: Nominalizer pass: Passive
pl: Plural prog: Progressive top: Topic

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Iksoo Kwon

Department of English Linguistics
Hankuk University of Foreign Studies
107 Imun-ro, Dongdaemun-gu, Seoul 02450, Korea
E-mail: kwoniks@hufs.ac.kr

Jung-Eun Lee

Department of English Linguistics
Hankuk University of Foreign Studies
107 Imun-ro, Dongdaemun-gu, Seoul 02450, Korea
E-mail: myenglish@hufs.ac.kr

Jinree Jeon

Department of English Linguistics
Hankuk University of Foreign Studies
107 Imun-ro, Dongdaemun-gu, Seoul 02450, Korea
E-mail: truculent228@hufs.ac.kr

Young-Eun Park

Department of English Linguistics

Hankuk University of Foreign Studies

107 Imun-ro, Dongdaemun-gu, Seoul 02450, Korea

E-mail: pye-top@hanmail.net

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