CHAPTER 1

INTRODUCTION

1.1 Introduction

Language is more than words. A lot of information that is conveyed in face-to-face conversation is not necessarily carried by the linguistic channel. Gesture is another channel for communication. Chui (2003:108) defines that "gestures are idiosyncratic spontaneous movements of hands and arms, which accompany the speech event with context-dependent meaning and use." These unique and spontaneous gestures play a very important role in the process of communication. McNeill (1992:2) claims that "gestures are an integral part of language as much as are words, phrases, and sentences."

Although there are various types of gestures, the focus in this study is on gestural beats. "Gestural beats are typically simple and small up and down or back and forth flicks of one or both hands or fingers; the movement is short and quick and the space may be the periphery of the gesture space" (McClave 1994, McNeill 1992). *Beats*, or *batons* in another term (Efron 1941), move along with the rhythmical

pulsation of speech (McNeill 1992:15). In other words, this gestural type seems to be timed with the rhythm of speech. Typically, gestural beats are imperceptible flicks of the hand or fingers. The feature which distinguishes beats from other types of gestures is that they have only two movement directions. There are three kinds of movements: *up-down*, *in-out*, and *left-right*.

An up-down pattern can be seen in Example (1). The speaker recounts one of the plot lines in a cartoon he has just watched. The event being described takes place at the time when each of the characters starts to eat food at a picnic. The speaker is describing what Mickey eats. The information about the food Mickey eats is conveyed in speech and expressed by a beat gesture. In this example, both the speaker's hands are on his thighs and rise to waist level. Then, his index finger of his right hand flicks down quickly when he utters the verb *chi* 'to eat' and the first syllable *xiang* of *xiangjiao* 'banana.'

(1)   A: …na   miqi   shi,\
            that   Mickey   COP
         …(.9)you,_
              have
→   ..uh   **chi**=,_
         pause   eat

chi 'to eat': index finger of right hand flicks down quickly

→   …(.9)**xiang**jiao   ma,\
           banana   PRT

1st syllable of *xiangjiao* 'banana': index finger of right hand flicks down quickly

A: 'Mickey eats a banana.'

In Example (2), the speaker recounts one of the plot lines about the fight between Mickey and an octopus. The description includes a gestural beat. Both the speaker's hands are on his thighs at first. Then, they move up quickly at the moment of uttering the noun *mao* 'anchor' and then his both hands move down to both thighs again.

(2)   A: (0)jiu,\
         then
        …hen   nan   dadao ta._
         DEG   difficult hit   3SG
        …ranhou houlai,_
         then   then
→   ..miqi   jiu   xiangdao yong nage   **mao**,/
        Mickey then   think of use   that   anchor

mao 'anchor': both hands move up quickly from both thighs

      …qu yong na   zhi   zhangyu,/
        go use   that   CL   octopus

A: 'Then, it is very difficult to hit him (the octopus) so Mickey thinks of using an anchor to hit him.'

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The second kind of beat movement is an in-out pattern, as in Examples (3) and (4). The speaker narrates how Mickey and Minnie appear on the scene in Example (3). He puts both his hands on his thighs and raises them to waist level. Then, both fists flick inward quickly when he utters *da* 'big' and *cheng* 'to hold.'

(3)   A: ..milaoshu zai   xiamian yong,\
        Mickey PERP under   use
→   …**da**   yangsan,\
       big   parasol

da 'big': both fists flick inward quickly

→   ..**cheng**zhe ta,\
       hold   3SG

cheng 'to hold': both fists flick inward quickly

  A: 'Mickey is under (a big parasol) and uses it to hold her (Minnie).'

In the following Example (4), the speaker describes the situation where Pluto hides himself under the picnic cloth. The octopus jumps onto the picnic cloth and seizes him. Both of the speaker's hands are placed between his thighs before IU 1 is produced. Then, his left hand slowly rises to chest level. The index finger of his left hand flicks outward when he says the first syllable of the verb *zhuazhu* 'to seize.'

(4)   A: …na   zhangyu   cong   shangmian,\
              that   octopus   PREP   above

→   ..**zhua**zhu   ta._
          seize   3SG

1st syllable of *zhuazhu* 'to seize': index finger of left hand flicks outward

A: 'That octopus seizes him (Pluto) above (the picnic cloth).'

Finally, the last type of a gestural beat is a left-right movement. In Example (5), Mickey throws a chicken leg to Pluto and Pluto uses his mouth to pick it up. In this example, both of the speaker's hands are between his thighs. Then, he opens his right palm at chest level and flicks it to the left side of the body when the first syllable *ji* of *jitui* 'chicken leg' is uttered.

(5)   A: …nazhihou,\
              then

→   ..miqi   you   ba   yi   zhi   **ji**tui,\
          Mickey   have   BA   one   CL   chicken leg

1st syllable of *jitui* 'chicken leg': right palm opens at chest level and flicks to left side of the body

…(.7)diuqu gei   bulutuo   jie._
          throw to   Pluto   catch

A: 'Then, Mickey throws a chicken leg to Pluto to pick it up.'

In Example (6), both of the speaker's hands are on his thighs at first and rise

slowly to waist level at the beginning of the noun *zhangyu* 'octopus.' Then, a gestural

beat is produced. Both hands flick quickly to the right when the speaker utters the

negative morpheme *mei*.

(6)   A: …na   zhangyu shanguo nage mao,/
              that   octopus dodge   that anchor
→   …danshi **mei**   shanguo   nage   shenghuan,/
           but   NEG   dodge   that   the circle of the rope

mei 'not': both hands flick quickly to the right

A: 'That octopus dodged that anchor, but did not dodge the circle of
    the rope of the anchor.'

How to define a gestural beat is also relevant to this study, in addition to a

definition of the different types of gestural beats. According to McNeill (1992:83), a

gesture includes three main phases: 'preparation,' 'stroke,' and 'retraction.'

Preparation refers to "the limb moves away from its rest position to a position in

gesture space where the stroke begins"; stroke expresses the meaning of the gesture;

and retraction is the "return of the hand to a rest position." Both preparation and

retraction are optional while the stroke phase is obligatory.

However, beats are not constrained by the meanings of the accompanying

utterances. Although it is not possible to distinguish the phase of the stroke of a

gestural beat by an expression of the meanings, the three phases can still be identified.

For a gestural beat, the direction is distinguished in the stroke phase. It can be defined

as an up-down pattern, an in-out pattern or a left-right pattern, according to the

direction or movement of the beat.

Three examples will be used to illustrate the three phases of gesturing a beat. In

Example (7), the speaker describes a cow playing and floating on the ocean and then

losing her clothes.

(7)   A: …(1.2) na   zhi   niu,/
                  that   CL   cow
         …(1.3) jiushi,\
             that is
         …zai haibian <A ranhou A>,\
           at   beach   then
         …(1.5) yixia,\
             in a very short time
        ..jiushi,\
         that is
→   ..ba   ta   yifu   **yong**bujian   le.\
          BA   3SG   clothes   make disappear   PERF

1st syllable of *yifu* 'clothes': left hand rises from left thigh to waist

1st syllable of *yongbujian* 'to make disappear': left hand flicks to left

at the end of the clause: left hand returns to thigh

A: 'Then, that cow makes her clothes disappear at the beach in a very
     short time.'

In the above example, the speaker raises her hand from her thigh to waist level

at concurrent with the speech *yi* of *yifu* 'clothes' in the preparation phase. In the stroke, the left hand flicks to the left side when *yong* is uttered. Then, in the retraction, the left hand returns to her thigh at the end of the clause. Therefore, the left-beat is the stroke in this left-right pattern.

In Example (8), Mickey, Minnie, the horse and the cow fight against the octopus while Pluto is hiding himself under the picnic cloth.

(8)   A: ..ranhou <A miqi   gen   mini   han   na   zhi   niu A>,_
                then   Mickey and Minnie and   that   CL   cow
            …jiu   yi% --
              EMP   together
          ..han   yiqi,\
            with/and   together
          ..yao   duifu,\
           in order to   fight

1st syllable of *duifu* 'to fight': right hand rises from right thigh to front of chest

        ..na%,\
          that
→   …**na**   zhi   da   zhangyu./
           that   CL   big   octopus

na 'that': palm of right hand opens and faces up and flicks down
            quickly

last syllable of *zhangyu* 'octopus': right hand returns to right thigh

A: 'Then, Mickey, Minnie and the cow fight against the big octopus together.'

In the above example, the preparation phase starts at the first syllable *dui* of *duifu* 'to fight.' The speaker raises her right hand from her thigh to waist level, and then to the front of her chest. Then, the stroke starts at the word *na* 'that.' The palm of her right hand opens and faces up and flicks down quickly. At the speech of *yu* of *zhangyu* 'an octopus,' the right hand returns to her thigh. Therefore, the downbeat is the stroke and the whole movement forms an up-down pattern.

In the following Example (9), the speaker describes the event where the horse fights against the octopus by spitting watermelon seeds. At the same time, she produces a beat gesture.

(9)   A: …ma   yong   nage,\
                horse   use   that
             …(.9) xiguazi   ranhou,\
                    watermelon seeds   then
             …chiyichi,\
                eat

      chiyichi 'to eat': both hands rise from both thighs to the front of waist

             ..ranhou yong,\
                then   use
   →   ..na   **xi**guazi,_
                that   watermelon seeds

      1st syllable of *xiguazi* 'watermelon seeds': both hands move forward and flick at waist

      last syllable of *xiguazi* 'watermelon seeds': left hand returns to left thigh

..qu ^tan   na   ge   zhangyu./
go shoot   that   CL   octopus

A: 'The horse eats the watermelons and then spits the seeds at the
octopus.'

In the above example, the speaker raises both hands from the thighs to the front of the waist level when uttering the first syllable of the verb *chiyichi* 'to eat.' Then, her hands move outward and flick at waist level when she utters *xi* of *xiguazi* 'watermelon seeds.' This is the stroke. Finally, at the moment of uttering *zi* 'a seed' in *xiguazi* 'watermelon seeds,' her left hand returns to her thigh. Therefore, the outward-beat is considered as the stroke.

As mentioned earlier, both preparation and retraction are optional for a gesture while the stroke phase is obligatory. Thus, gestural descriptions of all of the examples in this thesis indicate the stroke phase.

1.2 Other Types of Gesture

Since this study will compare beat gestures with the other types, it will also introduce McNeill's (1992) taxonomy of other gestural types: 'iconics,' 'metaphorics,' 'deictics,' and 'cohesives.'

First, *iconics* "bear a close formal relationship to the semantic content of speech" (McNeill 1992:12). More specifically, this type of the gesture represents a

concrete idea. In the following Example (10), Pluto is at the beach and a crab passes

by. Pluto sees the crab and walks behind it. The crab then nips his tail and nose and

Pluto is hurt and wants to fling the crab away. The actions performed by Pluto all look

like circling.

(10)   A: …(.9) bulutuo   jiushi,\
                    Pluto   that is

          1st syllable of *jiushi* 'that is': right hand rises from right thigh to chest,
          right palm faces down, and then index finger stretches out

→   …**rao**% --
              circuit around

          rao 'to circuit around': index finger of right hand circles around once

→   …**rao**   **yuanquan**,_
              circuit around   a circle

          rao yuanquan 'to circle around': index finger of right hand circles
          around three times

          …(.8)<A rao   yuanquan A>,\
                    circuit around   a circle
          ..zai yuandi   xuanzhuan.\
            at   the same place   spin
          …ranhou   ne,\
              then   PRT
          …ba   pangxie shuaidiao le.\
            BA   crab   fling   PRF

          A: 'Pluto, that is, circles around and spins in the same place and then
              the crab is flung away.'

In the above excerpt, at the preparation phase of gesticulation, the speaker raises his right hand from the thigh to chest level. The palm faces down and the index finger stretches out when the first syllable *jiu* of *jiushi* 'that is' is uttered. The index finger of the right hand circles around once to represent the concrete idea of the movement when the speaker utters the verb *rao* 'to circle around.' Then, he makes the same gesture three times with the utterance of *rao yuanquan* 'to make a circuit around the circle.' Finally, the iconic gesture retracts to his thigh when the verb *rao* 'to circle around' in IU 4 is uttered.

Metaphorics are like iconic gestures, but they represent an abstract idea. In other words, this gesture "presents an image of the invisible—an image of abstraction" (McNeill 1992:14). In Example (11), the speaker expresses his idea about the success of the Disney cartoon. The hand movement for the verbal phrase *jiagouchu* 'to give a framework' is conceptualized metaphorically to form a conduit gesture. First, both the speaker's hands are placed between his thighs. Then, the hands move up and apart from each other, but stay with one palm facing the other, and the fingers form a shape of a container in which the story is placed. The hands then move to the left. The speaker presents the idea of structuring a framework for a story as a container by the movement of hands. This type of gesture is called a metaphoric gesture.

(11)   A: …(.8) jiu   kao   renwu   de,\
                 EMP   based on   character   POSS

         ..biaoqing,/
          facial expressions

         ..dongzuo,\
           movements/actions

         …haiyou   yidian,\
           and/still have   a little

         …(.8)dapei,\
              collocation

         …shengyin._
            sound

         …(.8)jiu,\
              EMP

→   …(.9)**jia**gouchu   yi   ge   gushi.\
              give a framework   one CL   story

    1st syllable of *jiagouchu* 'to give a framework': hands are separate,
    palm facing palm, and fingers form a container shape

    A: 'A framework of a story is structured based on characters' facial
       expressions, movements and the effect of sounds.'

As for *deictics*, they are pointing gestures which "indicate objects and events in the concrete world or where there is nothing objectively present to point at" (McNeill 1992:18). In the following excerpt (12), the speaker describes an event in which Mickey throws food to Pluto at the picnic. The speaker's left palm faces up and the index finger points forward when she utters the noun *gou* 'dog' as if she could see an invisible object made visible before her.

(12)   A: …(.7) yecan   de   shihou,\
                picnic   ASSC   time
       …nage   miqi,/
        that   Mickey
       …ta   jiu   diu   dongxi   gei% --
        3SG   then throw something to
       …(1.1) gei   ta   de,_
                to 3SG   POSS
→   …na   zhi   **gou**._
        that   CL   dog

gou 'dog': left palm faces up and index finger points forward

A: 'Mickey throws something to his dog (Pluto) during the picnic.'

The last gestural type is *cohesive gestures* which "serve to tie thematically related but temporally separated parts of the discourse" (McNeill 1992:16). They are not restricted by the forms of hand movements based on McNeill's (1992) claim. This type of gesture is defined mainly with reference to its discourse function. The repetition of the same gesture forms, movements, or locus in the gesture space shows the continuity of information or a theme. In other words, a speaker repeats a gesture with the same information presented previously in the following speech, so a *cohesive gesture* can consist of *iconics*, *metaphorics*, *deictics*, or *beats*. Therefore, this gesture will not be particularly distinguished in the study.

1.3 Motivation and Purpose

There are two reasons for choosing beats as the focus of research. One is that this type of hand movement is always the majority as shown in previous studies. McNeill (1992) investigated gestures by analyzing English narratives. The distributions are presented in Table 1, originally from McNeill (1992:286). Then, the distributions from Chui (2005b:638) for Chinese conversation are presented for comparison in Table 2.

Table 1. Frequency Distribution of Various Types of Gestures in English Narratives (McNeill 1992:286)

	n	%
Iconic gestures	261	43.5
Metaphoric gestures	43	7.2
Deictic gestures	28	4.6
Beats	**268**	**44.7**
Total	600	100.0

Table 2 shows the statistics of Chui's (2005b:638) study based on Chinese conversation. The distribution of the frequency of the beats is 52.9%.

Table 2. Frequency Distribution of Gestural Types in Chinese Conversation (Chui 2005b:638)

	n	%
Iconic gestures	343	23.3
Metaphoric gestures	27	1.8
Deictic gestures	158	10.7
Spatial gestures	167	11.3
Beats	**780**	**52.9**
Total	1475	100.0

These two results indicate that this type of hand movement is in the majority whether it occurs in very different languages. In addition, there is evidence that the occurrence of gestural beats may not be affected by the variety of the genre of verbal communication; beat gestures are still the majority when comparing the results in Table 2 to those in Table 3 of Section 1.4, no matter whether they occur in a narrative or in a conversation in Chinese. Thus, beat gestures are the focus of this study. The other reason for investigating gestural beats is that they are rarely discussed and investigated in Chinese linguistics.

The purpose of the thesis is to investigate gestural beats in Chinese narrative discourse at both pragmatic and acoustic levels. McNeill and Levy (1993) propose that gesturing can be affected by the information state of associated referents. This study also considers grounding, in addition to the information state. Grounding is "an important, fundamental property of text organization" (Chui 2001:1). This discourse function is universal consisting of foreground and background information. In this

thesis, the relationship between information state, grounding, and gestural beats will be studied.

At the acoustic level, previous studies have postulated a close correlation between intonation and gesture. Kendon (1972) observed a gestural hierarchy with an intonational hierarchy. However, more specific changes in intonation were not investigated in that research. Later, Bolinger (1983:169) claimed that "facial and manual gestures if any will normally parallel the line of pitch." Beats are small up and down, or back and forth, flicks of one or both hands. They move along with the pulsation of speech (McNeill 1992:15). Similarly, Tuite (1993:100) also notes that the stroke of a beat "tends to coincide with the nuclear syllable of the accompanying tone group." Later, by examining the data of conversations, McClave (1994) proposes a rhythm hypothesis for beat gestures. In her study, she claims that "beats are rhythmically patterned by themselves" (McClave 1994:46). The pattern is independent of speech. Based on these pioneering studies, there seems to be a correlation between a rhythmic pulse and a gestural beat; therefore, these findings provide the motivation to examine whether there is any acoustic pattern in the beats.

1.4 Database

The data for this study were oral narratives produced by four undergraduates in

2002, two males and two females. All the data are from Chui's NSC projects.[1] Each

subject watched an animated color cartoon film of "Mickey Mouse and his Friends."[2]

All the subjects watched the same story. The cartoon was about seven minutes long

and it included music but no conversation. The plot concerns a beach party held by

Mickey, Minnie, Pluto, a horse and a cow who are playing around and having a picnic.

However, their picnic is interrupted by a fight with an octopus, but they win in the

end.

After watching the cartoon, each subject was asked to recount the story from

their memory immediately to a listener or an interviewer. The whole process was

audio-video taped. The subjects were not told about the particular focus of this

research. The narrative data were coded according to Du Bois et al.'s (1993) outlines

for transcriptions.[3] Gestures were transcribed by using McNeill's (1992) system. All

the gestures were transcribed and analyzed on computer by using MediaStudio Pro

6.5, with the feature of frame-by-frame advance and the capability of showing slow

motion with no muting. Therefore, movements and sounds could be matched and

heard in real time. The total amount of gestures produced by the four subjects was 505.

Table 3 shows the distribution of the frequency of various types of gestures with beat

gestures comprising 57.6% (291 instances).

[2] See Appendix A for the events of the main story line.
[3] See Appendix C for transcription conventions.

Table 3. Frequency Distribution of Gestural Types in Chinese Narratives

	n	%
Iconic gestures	185	36.6
Metaphoric gestures	8	1.6
Deictic gestures	21	4.2
Beats	**291**	**57.6**
Total	505	100.0

In the present data, it is further observed that gestural beats can co-occur with the following syntactic categories: nouns, verbs, adjectives, adverbs, conjunctions, prepositions, particles, and sequential connectives. In addtion, they are also found to co-occur with the negative morpheme as the negative marker, the morpheme BEI as the patient marker, and pauses. The statistics are given in Table 4.

Table 4. Frequency Distribution of Syntactic Categories and Pauses for Gestural Beats

	n	%
Noun	130	44.8
Verb	90	30.9
Adjective	7	2.4
Adverb	34	11.7
Conjunction	9	3.1
Preposition	4	1.4
Particle	3	1.0
Sequential Connective	3	1.0
Negative Morpheme	5	1.7
Morpheme BEI	3	1.0
Pause	3	1.0
Total	291	100.0

In Table 4, the occurrences of gestural beats occur with both nouns (44.8%, 130 instances out of 291) and verbs (30.9%, 90 instances out of 291) and comprise the majority of cases, although this gestural type can occur at a variety of syntactic categories and pauses.

As for three directions of gestural beats of the data, the frequency distribution in Table 5 shows that up-down movements are the most common. 146 instances (50.17%) are found in the corpus.

Table 5. Frequency Distribution of Three Movements for Gestural Beats

	n	%
Up-down	146	50.17
In-out	61	20.96
Left-right	84	28.87
Total	291	100.0

After the gestures were transcribed, the audio data of speech accompanying gestural beats was analyzed on a Kay's Model 4100 and Praat,[4] a system for doing phonetics by computer. The acoustic patterns of the pitch contour and the intensity analysis for each intonation unit with word boundaries were identified by means of spectrograms. Acoustic annotations are done by using the Praat. In addition to wave forms, spectrograms, a pitch contour, and an intensity contour, speech transcriptions

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[4] Visit   http://www.fon.hum.uva.nl/praat/

and glosses are presented in the Praat.

Moreover, in order to examine if there is any pattern for producing gestural beats, continuous beats were further analyzed on computer by using Ulead VideoStudio 10, with the feature of frame-by-frame advance down to $^1/_{30}$ second. These continuous beats were further annotated in the Anvil,[5] a video annotation tool. Anvil can not only display videos but also has playback controls including various speeds with no muting. It contains tracks in its annotation board and the type of each track is defined by its own user. It also has the feature of frame-by-frame advance down to $^1/_{30}$ second between each second. In addition, a playback line can run across by all tracks and the video synchronizes with it when the playback line moves forward or backward. Moreover, there needs to be an examination in this study of the relationship between the acoustic factor, namely pitch changes, and the movements of beat gestures. Anvil can import transcriptions made by the Praat so that they can co-exist.

1.5 Organization of the Thesis

This thesis consists of five chapters. In Chapter 2, I review the literature related to the fields of gestures, pragmatics and acoustics, focusing on those studies that deal

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[5] Visit   http://www.anvil-software.de/

with their interaction. In Chapter 3, I present the data analysis and discuss the results

for the relationship among gestural beats, grounding and information state. Chapter 4

investigates and discusses gestural beats from the acoustic level to analyze and

present the acoustic patterns. Finally, Chapter 5 contains a discussion on the

interaction between pragmatic and acoustic findings, the implications of the study and

suggestions for future research.