

**The dynamics of ensemble:
the case for flamenco**

Mariana Maduell and Alan M. Wing

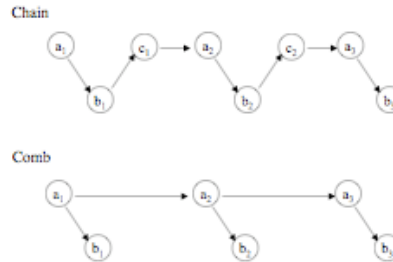
**Presented by Isaac Schankler and Wesley Yeh
ISE 575 / University of Southern California
April 27th, 2010**

Introduction

- Coordination between ensemble members key to successful performance
- Tempo as most important aspect of coordination (Scollon 1981)
- How do members of a group share, develop a common tempo?
- Past studies mostly focus on Western classical music
- Present study analyzes flamenco music: inclusion of dancers, role of improvisation

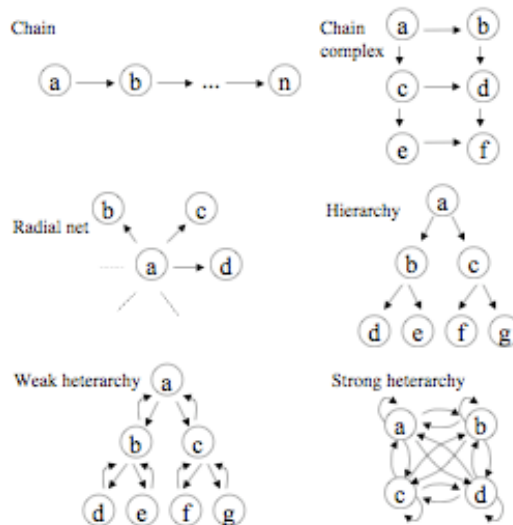
Music ensemble and connected networks

- Problems in control of motor behavior: sequencing of components of an action, coordination of multi-limb, multi-segmental movement
- Example of multi-finger typing (see picture)
- Applicability to ensemble coordination



Music ensemble and connected networks

- More connected network models
- Classical orchestra as radial net model w/ conductor at center, with elements of hierarchy and heterarchy
- Cues (notated, visual, aural) as links (arrows) in the network



Music ensemble and connected networks

- Studies confirm importance of cues in coordination (Williamon and Davidson 2002, Price and Byo 2002, Goodman 2002)
- However, a certain degree of asynchrony seems to be permissible, even desirable (Rasch 1979, 1988, Friberg and Sundström 2002)

What is flamenco?

- Ensemble art form utilizing:
 - Song
 - Dance
 - Musical accompaniment
 - Guitar
 - Possibly other musical instruments
 - Calls
 - Coordinated rhythmic backbone of:
 - Hand-clapping
 - Foot-stomping
 - Finger-snapping
 - Tongue-clicking
 - Etc.

What is flamenco?

- Hand-clapping: *palmas*
 - *Palmas sordas*: “deaf *palmas*” - cupped palms, soft sound
 - *Palmas fuertes/secas/claras*: “strong/dry/clear *palmas*” - 3 fingers, tensed palm, sharp/crisp sound
- Flamenco ensemble: *cuadro*
 - Guitarist (*guitarrista/tocaor*)
 - Singer (*cantaor/cantaora*)
 - Dancer (*bailaor/bailaroa*)
 - *Palmeros/jaleadores*
 - Rhythmical support (esp. *palmas*)
 - Vocal encouragement (*jaleos*)

What is flamenco?

- Style/form of piece: *palo*
 - First and last piece of a performance: short solos danced by various members
 - E.g. *fandangos de Huelva, tangos, rumba, bulerías*
 - Pieces in between feature single ensemble members
 - E.g. *alegrías, soleá, soleá por bulerías, tangos, tientos*
 - Less common: *seguiriyas, farruca, guajiras*, etc.
- Piece lasts from 3-20 min.
- Performance lasts 20 min. to several hours
- In ensemble numbers, performers sometimes stop at the end of their segments, sometimes fade into the background

What is flamenco?

TABLE 1 Sample programme for a flamenco performance

Piece, usually by palo	Type	Relative duration	Internal stops
Sevillanas	Ensemble duets	Short	Yes
Alegrías	Solo	Short	Yes
Soleá	Solo	Short to longer	Yes
Tanguillo	Solo	Short	Possibly
Farruca	Solo	Longer	Yes
Rumba	Ensemble solos	Short to longer solos	Probably
Guitar solo(s)	Solo	Short to long	Possibly
Fandangos de Huelva	Ensemble solos	Short solos	Possibly
Tientos	Solo	Longer	Yes
Soleá por bulerías	Solo	Longer	Probably
Alegrías	Solo	Longer	Yes
Soleá	Solo	Longer	Yes
Bulerías	Ensemble solos	Short to longer solos	Yes
Encore(s) (optional)	Ensemble solos	Short solos	Possibly

- Guitar solo displays non-accompanimental skills, allows time for costume changes

Timing issues in flamenco

- Interaction between dancer (D), singer (S), guitarist (G) and palmeros (P)
- Discrete underlying rhythmic structures for different *palos*: performers must be *estar enterao* (“in the know”)
- Singers select *cante* (songs) on the spot; guitarists must not anticipate, since singers can shorten or lengthen at will
- Improvisation, variation

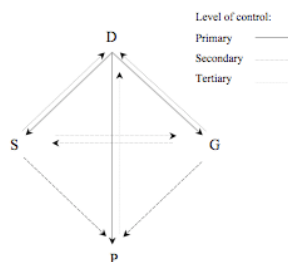


FIGURE 3 Normal control pattern for full flamenco ensemble during a dancer's solo piece. D = dancer, G = guitar, S = singer, P = palmeros and the number of each may be more than one. The arrows indicate the normal direction of control.

Timing issues in flamenco

- *Compás* (accompanimental patterns):

- *Llamada* (“call”) - highly marked, signals a change
 - *Cierre* - closing
 - *Desplante* - “uprooting”

TABLE 2. Some basic compás structures and acceptable variations used by palmeros in bulerías (12 counts). A (a) signifies accented (unaccented) clap, - indicates a count with no clap, -u has a clap half way between counts, -uu has claps 1/3 and 2/3 between counts

Type of compás	Count												
	(12)	1	2	3	4	5	6	7	8	9	10	11	12
1. (basic)	A	u	u	A	u	u	A	u	A	u	A	u	A
2. (basic)	A	u	u	A	u	u	u	A	A	u	A	u	A
3. (basic)	A	-u	-	A	-	-	-	A	A	-	A	-	A
4. (basic)	A	u	u	A	u	u	A	u	u	A	u	u	A
5. (basic)	-	u	u	-	u	u	-	u	u	-	u	u	-
6. (countertime)	-u	-u	-u	-u	-u	-u	-u	-u	-u	-u	-u	-u	-u
7. (countertime)	-	-u	-u	-	-	-	-	-u	-u	-u	-	-	-
8. (countertime)	A	-u	-u	-u	A	-	A	-u	-u	-u	A	-	A
9. (triples)	-uu	-uu	-uu	-uu	-uu	-uu	-uu	-uu	-uu	-uu	-uu	-uu	-uu
10. (llamada)	-	A	A	A	u	u	A	u	A	u	A	u	A
11. (llamada)	-	A	A	A	u	u	u	A	A	u	A	u	A
12. (llamada of displante)	-	A	A	A	-	-	-	A	A	A	A	A	-
13. (cierre/llamada)	-	A	A	A	u	u	A	u	A	u	A	-	-

Timing issues in flamenco

- Ensemble must follow focal performer’s attempts to speed up/slow down
- Potential problems:
 - Adjustment delays by accompanists
 - Accompanists may fail to give discernable accents
 - However, if rhythmic structure is lost, unaccented clapping may allow focal performer to reassert structure

Connected network model applied to flamenco

- Two major factors governing performer participation in ensemble:
 - Focus
 - Order: dancer, singer, guitarist
 - Formal/informal hierarchy
 - Possible order: company head, head’s partner, guest artists, “first dancers,” well-known members, lower status members
- Provision for emergency control
 - If rhythmic connection between ensemble members is lost, control may be assumed by whoever can restore it
- Not all timing influences (arrows in network) necessarily active all the time

Cues supporting flamenco ensemble

- Cues may be musical, verbal or visual
- References to flamenco cues are rare
- Foot-stomping, hand-waving, shout from dancer to guitarist; can be preset or spontaneous (Matteo 1990)
- Authors contend there must be more cues, because there is a need for clear signals

TABLE 3 Commonly used flamenco ensemble rhythm control methods (developed from Maduell, 1987, 1994)

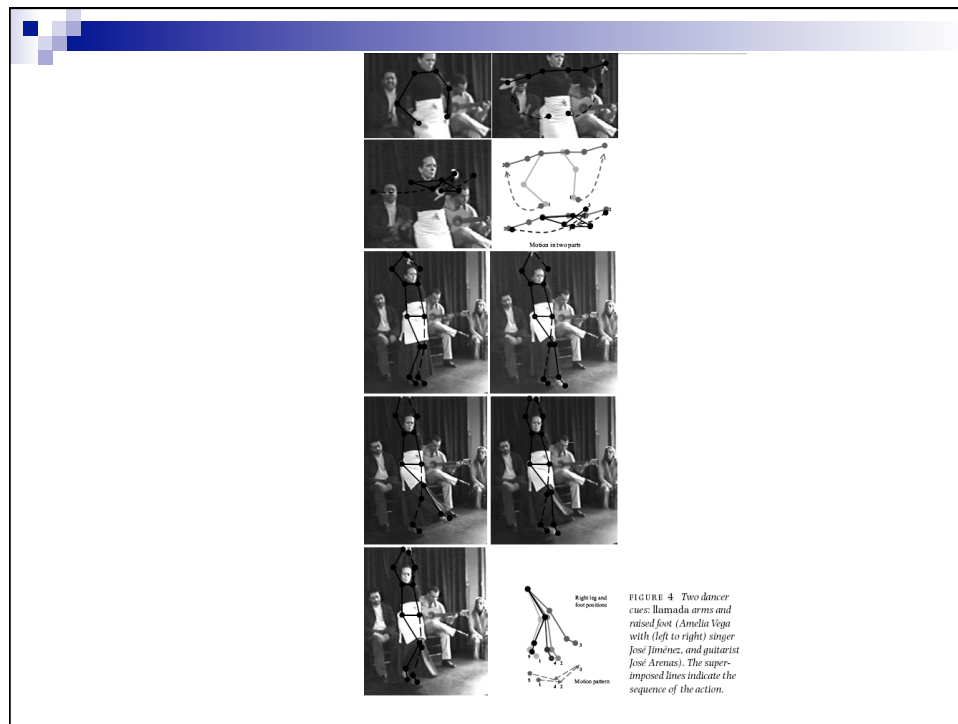
Dancer	Singer or palmero	Guitarist
accented palmas OR tacones	accented palmas	rhythmical playing
accented palmas PLUS taconeo	accented palmas PLUS foot-accents	guitar-tapping OR accented palmas
rhythmical body movements pitax speech	rhythmical speech	foot-tapping

Study 1: FLAMENCO ENSEMBLE REHEARSAL AND PERFORMANCE

- Ensemble consisted of:
- Two males (*guitarrista* and *cantaor*) and one female (*bailaora*).
- Started with a brief initial discussion and proceeding to three play-throughs, which were treated as practice runs. They were then joined by another female (*palmera*) for two performances.
- Cue frequencies recorded

TABLE 4 Frequency of cues produced by dancer (D), guitarist (G) and singer (S) during third and final rehearsal (r3) and two immediately successive performances (p1, p2)

	r-3	p-1	p-2		r-3	p-1	p-2		r-3	p-1	p-2
Dancer				Guitarist				Singer			
D arm/body gesture	1							S hand gesture			1
D arms up	1	1	3								
D <i>llamada</i> arms	4	7	8					S subtotal arm/body gestures			1
D subtotal arm/body gestures	6	8	11					S foot tap		2	
D accented <i>taconeo</i>	1	1	1	G foot tap		1		S stomp			1
D <i>llamada</i> feet	1	1	1								
D raise foot	2	2	4					S subtotal foot gestures		2	1
D stomp		4	3	G subtotal foot gestures		1		S look G	3	1	
D subtotal foot gestures	4	8	9	G head gesture to P	1			S look P	1	1	
D eyebrow	1			G look D		1					
D look G	1	2		G look S	2	1					
D look and nod	1							S subtotal face/head gestures	4	2	
D look to side	1			G subtotal face/head gestures	3	2					
D subtotal face/head gestures	4	2									
D <i>piño</i>	1	1	1					S verbal			1
D move to front		1						S total cues	4	4	3
D verbal		5	3	G total cues	3	3	0	visual cues	4	2	1
D total cues	15	25	24	visual cues	3	2	0	auditory cues	0	2	2
visual cues	12	13	15	auditory cues	0	1	0	rhythmical cues	0	2	1
auditory cues	3	12	9	rhythmical cues	0	1	0				
rhythmical cues	8	19	19								
(incl. verbal)	0.53	0.76	0.79								
(excl. verbal)		0.56	0.67			0.33				0.5	0.33



Observation

- The use of *llamada arms* was by far the most frequent cue given by the dancer.
- Head cues were not as prominent
- Guitarist made eye contact with ensemble members
- Singer helped maintain rhythmic control by playing accented *palmas* (percussion-like hand claps)

Discussion

- 72 out of 81 cues were non-verbal
- However, guitarist may insert a lyrical phrase when the singer pauses or the dancer may insert *taconeos*(rhythm) segments between song pauses
- Dancer produced more cues during performance than during rehearsal – cues are less necessary during rehearsal

Discussion

- Are cues actually recognized and acted upon by the ensemble?
- After working together for a long time, it may seem second nature
- Study showed that the cues are indeed acted upon
- Leadership shifting observed

Leadership

- Leader (Vocal performer, etc.) sets the rhythm and members of the group follow with some delay so that the current group interval reflects the previous intervals of the leader.
- Followers have a delay and may overextend from the cues given by the leader

Leadership

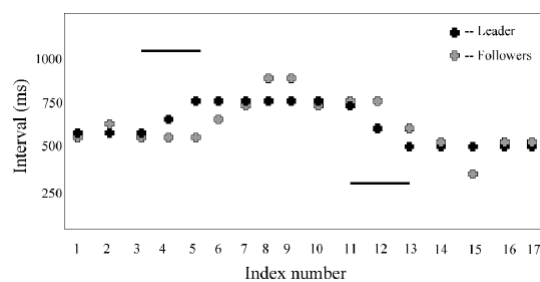
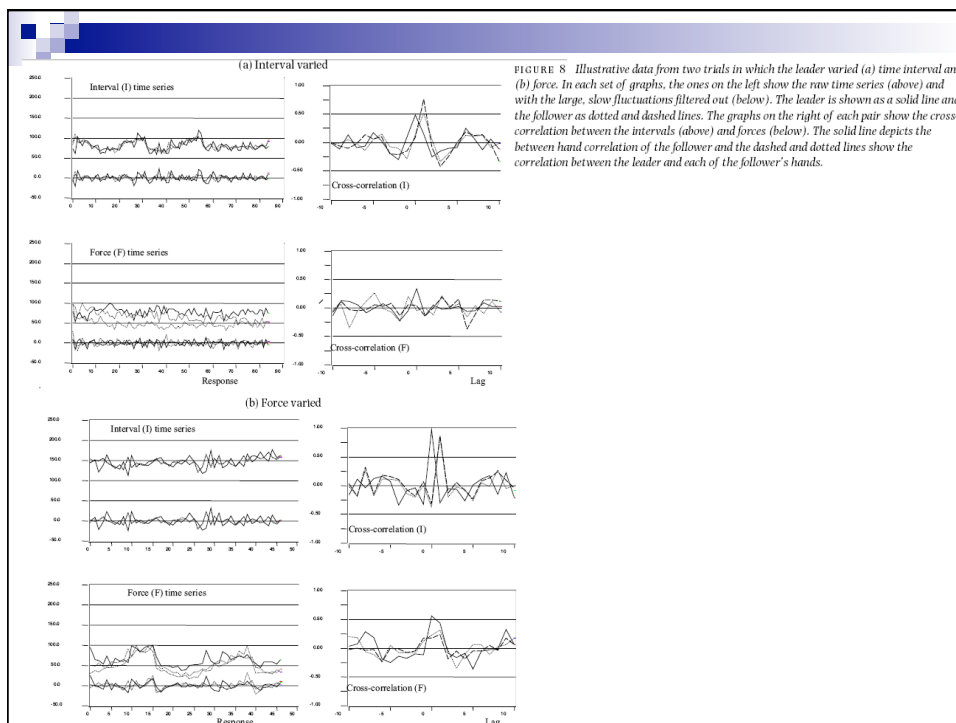


FIGURE 7 Hypothetical timing example showing adjustment between leader and followers.

Study 2: ILLUSTRATION OF WITHIN AND BETWEEN INDIVIDUAL COORDINATION

- Cooperative performance tries to match tempo and dynamics
- But if there is an element of spontaneity (improvisation), prediction may fail or require tuning between actual and expected tempo/dynamics.
- Study: how one subject tracks the performance of another subject who introduces intentional variations in tempo and dynamics.
- Experiment: follower, in trials, to either focus on coordinating his timing or his force with the leader's taps.



Study 2 Observation

- Generally very consistent and reflective of leader's cues.
- Variations in the time series are more evident in the force data and less so in the time intervals.
- Possible to extend this experiment to multi-person (more than 2)

Conclusion

- This paper illustrated how rhythm is coordinated in flamenco ensembles
- Cues usually from a leader are given; lower status members are expected to follow planned and improvised content
- Followers are very sensitive to cues
- Dilemma: what happens when leader is always shifting, how can this be modeled?