
Turn-usurping in dialogic collaborative problem solving

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Introduction

Bakhtinian (1895-1975) **dialogic framework**

Truth is not born nor is it to be found inside the head of an individual person, it is born between people collectively searching for truth, in the process of their dialogic interaction. (Bakhtin, 1929/1984, p.110).

Introduction

Definition of dialogic collaborative problem solving :

A complex dynamic process whereby two or more consciousnesses, with **equal rights** and each with its own world, combine but are not merged in the unity of solving a shared problem.

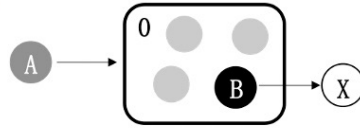
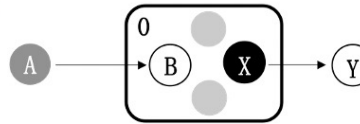
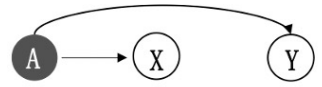
Introduction

The participation shift framework

“the way in which people move themselves and one another onto and off the floor” (Gibson, 2005, p.1,566).

Strengthen the
diversity of the
participation
structure

Individual
characteristics?

Participation shift	Formula	Illustration	Description
▪ Turn-receiving	AB-BX		A <u>talks</u> to B, then B talks to X (X could be A or the group).
▪ Turn-claiming	A0-BX		A <u>talks</u> to the group, then B talks to X (X could be A or the group).
▪ Turn-usurping	AB-XY		A <u>talks</u> to B, then to X (X is not B or A) talks to Y (Y could be A, B or the group).
▪ Turn-continuing	AB-AX		A <u>talks</u> to X (X could be the group), then A continues to talk to Y (Y could be the group).

a. The formula denotes the following: (speaker) (target) – (third party) (target of third party). The group is denoted as 0. X and Y represent people other than the neighbouring speaker and target.

Research question

- 1. How does turn-usurping affect the social structure of dialogic collaborative problem solving?
- 2. Who is likely to usurp a turn in dialogic collaborative problem solving?
- 3. What are the intentions for students to usurp a turn?
- 4. How does turn-usurping shape the flow of group discussion?

Method

- **Participants and procedures**
 - 168 fourth graders from five classes (41% females, 59% males) in a primary school in mainland China.
 - Grouped in four with balanced gender and prior mathematics grades
 - Solve three structured, open-process math problems.



Method

- Before task: Willingness to collaborate
- After task:
 - demographic information
 - mathematics learning enjoyment
 - mathematics self-concept, and
 - social anxiety
 - Subjective assessment on self and group performance

Method

- RQ1&RQ2: quantitative analysis
 - Coding participation shifts
 - ANOVA analysis
- RQ3&RQ4: qualitative analysis
 - Grounded-theory informed coding process
 - Three representative groups

Method

Does the speaker explicitly name the target interlocutor?

Yes, code it as the named interlocutor.

No. Does the speaker use *you* in the utterance?

Yes. Is there any clue indicating *you* not representing the last speaker?

Yes, code it as the inferred target.

No, code it as the last speaker.

No. Does the speaker use *we* in the utterance?

Yes. Is there any clue indicating *we* not representing the whole group?

Yes, code it as the inferred target.

No, code it as Group.

No. Does the utterances belong to a flow of discussion (at least 4 turns) with one specific interlocutor?

Yes, code it as the specific interlocutor.

No, code it as Group.

- Decision tree to code speaking target
- ($Kappa = 0.692$; Landis and Koch [1977]: 0–0.20 as slight, 0.21–0.40 as fair, 0.41–0.60 as moderate, 0.61–0.80 as substantial, and 0.81–1 as almost perfect)

Results

How turn-usurping shifts affect the social structure of dialogic collaborative problem solving? (RQ1)

- 42 groups, an average of 286 turns ($SD = 116$, $min = 104$, $max = 522$)
- Turn-receiving ($M = 43\%$, $SD = 10.3\%$)
- Turn-usurping ($M = 29\%$, $SD = 8.1\%$)
- Turn-claiming ($M = 28\%$, $SD = 7.5\%$).

Results

How turn-usurping shifts affect the social structure of dialogic collaborative problem solving? (RQ1)

- turn-usurping shifts was found to be correlated with the total number of turns one group produced ($r(42) = 0.459, p < .01$).
- turn-usurping is significantly negatively correlated with the standard deviation of individual participation rates ($r(42) = -0.534, p < .001$).

Results

Who are likely to participate through usurping turns (RQ1)

- turn-usurpers were more likely to be those with:
- low intellectual status, Chinese: ($r(144) = -0.332, p < .001$); Math: ($r(146) = -0.225, p < .01$) ,
- low self-concept ($r(146) = -0.225, p < .01$), and
- high social anxiety ($r(144) = -0.204, p < .05$) .

Results

Underlying intentions and the impact of turn-usurping shifts (RQ3 & 4)

Table 3: Characteristics of three selected groups

Group	Talkative-Good	Quiet-Good	Quiet-Bad
Number of turns	361	173	126
Score of group solution	7.67	8.33	3.00
Number of turn-usurping	122	56	33
Average prior mathematics grade of members	105.50	94.75	107.33

Results

Underlying intentions of turn-usurping shifts (RQ3 & 4)

- seldom caused interruptions of the last speaker (<10%)
- students usurped a turn mainly to
 - ***add on*** previous speaker,
 - initiate a turn ***to express new ideas*** or
 - ***propose*** some action plans,
 - jump in ***to regulate*** problem solving procedure and group functions,
 - ***disagree or agree*** with someone, and
 - initiate a ***question***

Results

turn-usurping could help open a new dialogic space through initiating new questions (turn 32) or expressing new ideas (turn

Turn	Speaker	Target	Content	P-shift	Intention of usurping
29	Sun	Group	Then think it over again. We think about how to calculate it on earth.	Receive	
30	Chen	Chen	If, if you are right...	Claim	
31	Sun	Chen	Think it over first ((Sun interrupted Chen)) (2.0)	Receive	
→ 32	Yan	Group	Does the tongue of the snake count or not? ((in low voice))	Usurp	Question
33	Qiu	Yan	It does not count.	Claim	
→ 34	Chen	Group	I think it should be three stones because the body of a real snake is not that big at all. If it was five stones and each stone is long, how could it be possible?	Usurp	Justify Challenge
35	Sun	Chen	If it was not five stones, it could not be three stones neither because it is crooked here.	Claim	
36	Chen	Sun	But I moved it here like this just now. I did like this after moving it here. Therefore, the crooked part has been counted in.	Receive	
→ 37	Qiu	Group	I think it is four stones.	Usurp	New idea
38	Sun	Qiu	Why?	Claim	

Results

help jump back to previous arguments (turn 34)

Turn	Speaker	Target	Content	P-shift	Intention of usurping
29	Sun	Group	Then think it over again. We think about how to calculate it on earth.	Receive	
30	Chen	Chen	If, if you are right...	Claim	
31	Sun	Chen	Think it over first ((Sun interrupted Chen)) (2.0)	Receive	
➡ 32	Yan	Group	Does the tongue of the snake count or not? ((in low voice))	Usurp	Question
33	Qiu	Yan	It does not count.	Claim	
➡ 34	Chen	Group	I think it should be three stones because the body of a real snake is not that big at all. If it was five stones and each stone is long, how could it be possible?	Usurp	Justify Challenge
35	Sun	Chen	If it was not five stones, it could not be three stones neither because it is crooked here.	Claim	
36	Chen	Sun	But I moved it here like this just now. I did like this after moving it here. Therefore, the crooked part has been counted in.	Receive	

Results

diverge the discussion flow through expressing disagreement (turn 42)

38	Sun	Qiu	Why?	Claim	
39	Chen	Qiu	Four stones are somewhat::	Usurp	Other
40	Qiu	Group	Move the head of the snake here, and then move here, then it reaches here after being straightened.	Receive	
41	Sun	Qiu	Yes::	Claim	
➡ 42	Chen	Qiu	If it was straightened, the tail could reach here at most.	Usurp	Disagree
➡ 43	Sun	Chen	Correct if being straightened. Straighten it, and it means it will reach here, right?	Usurp	Add on
44	Chen	Sun	Group leader ((Sun)), I have another idea that is we hypothesize it was several meters long, hypothesize::, hypothesize::	Receive	

Discussion and conclusion

- **Turn-usurping and participation equality**

1. turn-receiving is a robust turn-taking approach
2. the possible status problem in a group might worsen this situation
3. Turn-usurping reflects a speaker's strong agency
4. Help initiate a new chain of reciprocal conversation
5. The status problem in the present study

students who participated mostly through usurping turns were likely to be those with low intellectual status, low-level confidence in mathematics and high-level social anxiety

Discussion and conclusion

- **Constructive functions of turn-usurping**

students tend to produce high-quality utterances in a usurped turn
the possible status problem in a group might worsen this situation

1. the strong agency of students when they usurp a turn.
2. turn-usurping indicates a potential transition point in D-CPS and deserves further investigations in the future

Practical implications

1. Encourage students to freely jump right in group discussion through actively usurping turns in dialogic collaborative problem solving.
2. Monitor the status problem: whether a turn-usurper has been isolated in discussion.

Limitations

1. Audio data for coding the speaking target. Not achieving a substantial inter-coder agreement (>0.8).
2. Only three representative groups selected for the qualitative analysis part . the author was the only coder for the qualitative analysis
3. Contextualized in Chinese culture background and the level of primary school.

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