

## **ELICITING ARGUMENTATIVE REASONING AMONG SECONDARY SCHOOL CHILDREN USING SCENARIOS AND COUNTER-EVIDENCES ON SOCIAL ISSUES**

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*This study locates reasoning and argumentation within the domains of developmental psychology and curricular interventions. It then investigates patterns in arguments generated by children when faced with conflicting social scenarios. To this end, 12 students from two schools were interviewed via the Clinical Interview method. The findings that emerge from the analysis of their responses demonstrate children's tendency to argue by means of reasoning aligned with their prior knowledge and personal experience, and hold relevance for research in judgement of knowledge claims for meaning making. They also indicate that the position of authority may play an important role in elicitation of their arguments. Finally, the study outlines areas in the domain of reasoning and argumentation that exist in the scope for further research.*

### **INTRODUCTION**

One makes sense of their environment by means of the knowledge, skills and value sets they already possess and that are passed socially to them by means of education. Reasoning facilitates this assimilation, a process which is today understood to be indispensable in the process of defining curriculum for the generations to come (National Council of Educational Research and Training, 2006). This is where the skill of reasoning becomes significant to effect social transformation by enabling students to analyze their experiences and their learnings from those experiences. In this vein, the learner must be enabled to reason their immediate existence in the society as product and the inspiration of the disciplinary knowledge that is presented to them. Unfortunately, this enabling is yet to find representation in the way we reproduce knowledge in education. As an example of the disconnect that may exist in our education, one may consider the history of the anti-caste movement in India and the depiction of this movement within the school curriculum (Kumar, 1983; Vishwanath, 2012). One thus observes a pressing need to provide our educators and teachers with the tool of questioning and reasoning in order to effectively translate content into constructive learning.

### **LITERATURE REVIEW**

The discourse on reasoning amongst children today emerges out of the field of developmental psychology and builds itself against a strong reference to Piaget's work on systematic development of the cognitive processes of the child. Through his interactions with children, Piaget (1958) examined learning in children in terms of how they isolate and integrate variables in the environment.

In light of understanding environmental factors influencing reasoning, children's interaction with the 'other' in the form of peers, teachers and other adults have been studied as well. Shafto, Eaves, Navarro and Perfors' (2012) study attempts to model young children's reasoning about the knowledge and intent of the informants by analyzing their biases via a computational model of epistemic trust. Figures of authority play an important role in the practice of reasoning in children, for although they are found to not be naturally oriented towards obedience, they do understand social and institutional relevance of authority (Laupa, 1991) and their reasoning can be significantly influenced by teachers' expectation of "reasoned actions and responses" and authentic opportunities of reasoning (Diezmann, Watters & English, 2002). A deeper probe into children's reasoning through their responses to conflicting scenarios thus surfaces. With implications especially for the field of science education, these studies employ methodologies of semi-structured interviews with open ended questions and conduct conversational analyses on the "informal reasoning" employed by children in evaluation of complex socio-scientific issues via argumentation (Sadler, 2004). More studies in the contemporary research in reasoning today deem argumentation as a feasible gateway into uncovering the processes of reasoning amongst children (Kuhn, 1991). Kuhn's subsequent work (Kuhn, Cheney & Weinstock, 2000) unpacks this reasoning to reveal different levels at which personal epistemologies of children may operate (abolutist, multiplist and evaluativist) as 'knowing' of the child moves from objective dimensions to subjective ones. Fischer, et al. (2014) in their review of latest developments in the field of scientific reasoning and argumentation cite studies that depict students exhibiting "poor dialogic or social quality of argumentation as reflected in the social exchange and co-construction of arguments". However, there have been multiple techniques and models employed within classrooms that demonstrate positive results with regards to learning (Choppin, 2007; Elbers & Streefland, 2000; Forman, Larreamendy-Joerns, Stein, & Brown, 1999; Stylianou & Blanton, 2011).

In the Indian context, although the media, literature and academia are ripe with discursive conflicts as a result of a chaotic co-existence of cultures, the educational institution is one space, of many, wherein classroom spaces have been observed and reported to be didactic in nature, with little opportunities for alternative subjective expression by the students. (Educational Initiatives and Wipro, 2006; Smith, Hardman, & Tooley, 2005). Therefore, there is scope for exploration of reasoning and argumentation as it exists within the dialogic paradigm of children, with important implications for its application in the classroom scenario in the future.

## OBJECTIVE

This study aimed to:

1. Develop appropriate case scenarios (along with resource cues that constitute counter-claims) that are contemporary, familiar and present conflicting perspectives on issues of social concern.
2. Invite students to take a stance on the case through a process of reflection and reasoning by posing challenging counter-arguments.
3. Examine the patterns of argumentation emerging from the interactions with case scenarios.

## METHODOLOGY

The study employs an exploratory framework in investigation of the nature of argumentation in children. It

is set in two schools in Rajendranagar, Hyderabad. The first school is a government school and the second one a budget private school. The schools were chosen as per convenience as the study did not necessitate a case-specific or theme-specific criteria for the schools. Employing convenience sampling in the study, a sample of 12 students (6 boys and 6 girls) from eighth grade from the two schools was taken. The interaction took place in English.

It was necessary that the subject of conversation stimulate intensive expression of the child's opinions, and thus, have scope for taking a stance. Three topics holding such a scope were finalized based on the criteria of: familiarity of the child with the subject, relevance of the subject and scope for development of original arguments. The first topic related to vegetarianism versus non-vegetarianism, the second concerned whether video games are good or bad for players, and the third was the increase in establishments of supermarkets and whether it is good or should local markets be preferred. For each of the topics, a repository of anticipated reasoning of participants for their opinions was created and counter arguments justified by information endorsed by various authorities were developed. These authorities were: religious leaders, religious texts, news outlets, health websites, survey results, researchers and scientists, celebrity figures, a philosopher, a journalist, authors and a policy head. These figures represent multiple knowledges and multiple ways of knowing as extant in society, and thus there was an attempt to refrain from depicting a hierarchical legitimization of any one form of knowing. This was done to enable expression of the participants' personal opinions freely. Statements and findings by these knowledge authorities were printed on to placards categorized into two sets for each topic. Each topic, then, had two sets of placards wherein one presented arguments 'for' the topic and the other 'against'. These sets then comprised the tool that was used in the one-on-one interviews conducted with the participants.

It was important for the interviews to be guided by the response of the participant as the objective of the study seeks to elicit their unrestrained opinion. The planned questions were to be kept at a minimum and open ended, and further questioning would be for the purpose of encouraging elaboration or offering a counter argument in order to allow the participant's reasoning to surface. The study, thus, attempts an application of the Clinical Interview method (Ginsberg, 1997). The administration of the interviews with the participants happened with the aid of the informational placards as described earlier. Each interview had three sections corresponding to the three topics concerned, in the order:

1. Vegetarianism vs. Non-vegetarianism (T1)
2. Video games (T2)
3. Supermarkets vs. Local Markets (T3)

Each section commenced with the participants being asked one of the following questions as per the topic:

1. (a) Are you a vegetarian or a non-vegetarian?  
(b) Do you think being a vegetarian is better or is it better to be a non-vegetarian?
2. Do you think video games are good for us or bad for us?
3. Do you think it is better to have supermarkets or local markets?

Once the participant responded with the reasoning behind their opinion, they were offered a counter-argument

prepared on the placard. The pieces of information that were offered were either in direct contestation to their response, or implied the same. The interactions thus made were recorded via the sound recording application on the researcher's mobile phone and transcribed for analysis.

## ANALYSIS AND FINDINGS

An analysis of the data, identifying certain characteristics of the participants' responses is presented below. There is an attempt to shed light on their efforts to respond to a counter to their rationales, as they source that attempt from their personal beliefs (or as it may appear, epistemologies).

Table 1 depicts the number of counter-cues that were offered to the participants leading to either a complete change in the expressed stance of the participant ('Y'), no expressed shift in stance ('N') and a state of indecisiveness for a shift ('U'). Instances where the participant would express that they concede after continued countering of their reasons for their stances with information cues have been noted as Y. If their responses clearly showed that they were unyielding to the counter cues, they are noted as N. There were instances where ambiguity was observed in terms of the participants' shift in their stances. These are noted as 'U?' and depict a lack of any more reasons from the participant to justify their stance.

We can observe an increase in the average number of counter cues that the participants received over the course of progression of the interview from T1 to T3. T1 has an average of 1.91 counter cues, T2 an average of 2.5 and T3 has an average of 2.58. This may be representative of an increase in engagement on the participants' part to sustain their arguments as I presented them with more counter cues.

S.No	Participant	M/F	No. of Counters Cues	T1	No. of Counters Cues	T2	No. of Counters Cues
R1	Lavanya	F	1	U	3	U	3
R2	Sravani	F	1	U?	3	U	2
R3	Gayathri	F	3	Y	3	Y	3
R4	Vishnu	M	2	Y	1	U	2
R5	Yougesh	M	3	Y	4	U?	1
R6	Eshwar	M	2	U	2	Y	4
R7	Akshita	F	2	Y	4	U	5
R8	Sailaja	F	2	U	2	Y	3
R9	Soujanya	F	2	U	4	Y	4
R10	Mathew	M	2	Y	1	Y	1
R11	Mani	M	2	U	2	Y	1
R12	Suresh	M	1	Y	1	Y	2

**Table 1.** Number of Counter Cues and Shift in Stance  
Y=Yes, N= No, U= Undecided, U? = Undecided but questionable

A study of the nature of their shifts within the details of their interactions shows that the shifts from one argument to another may be looked at as three different kinds. The first kind of shifts include the participants (R12 in T1 and R5 in T3) that were reticent during the course of the topic in discussion. This reflects changing of stance almost as soon as a counter cue was given. The participants demonstrating a second kind of shift (R4, R6, R9 and R11) are significant because they justified their shifts in stance by directly stating the counter cues as justification, but did not yield as readily as in the first case. The third kind of shift was from participants (R1 and R5) that gave reasons that they did not draw from the informational counter cues that I gave them, but rather came up during the process of invocation of their reasoning.

(Lavanya, R1, has been stating that she thinks local markets are better and has been giving her reasons for her opinion. Following is the excerpt from when she is given the third counter cue.)

Interviewer: 67% of the people are saying it's good for India, and 36% are saying that it's not. More people are saying it's good for India. Do you think local markets are better still?

Lavanya: No, supermarkets are better. (laughs)

Interviewer: (laughs) Okay.

Lavanya: Supermarket have very fresh vegetables. In local market, they put vegetables on roadside. All vehicles are coming or going. That's why.

There were only two respondents (R4 and R9) who did not change their stance during the course of argumentation with them. Soujanya (R9) seemed especially persistent with her opinion (for T3) that local markets are better. I presented four counter cues to her and yet her opinion was the same. She appeared to be resorting to her personal experiences the most to strengthen her arguments. Similarly, R4 persisted with his stance for T3 as seen below:

Interviewer: ...that lets customers scan products and pay through the app. So customers will go use their mobile phone on the...pick one from the shelf, use it, use their app, and quickly put it in their cart, and their bill is made immediately. So it's very time efficient.

Student: In supermarket?

Interviewer: Hm

Student: Haan, yes sister. In local mark-

Interviewer: Do you still think local markets are better?

Student: Yeah, local markets only better. In supermarket, they buying... they not give extra. They wasting their times. I want this money, they requesting. Please give give...they requesting, that's not good. That's why they buying in Saturday markets, local markets.

The analysis of the participants so far, in terms of their shifts in stance, or lack of it, depicts that they do hold beliefs and opinions of their own and can make arguments to defend their stances. To this end, they may borrow from the information that is provided to them or they may utilize their own personal experience or

knowledge to uphold these stances. This quality of their responses itself is indicative of the conceptual involvement that the interaction could garner from them. Their production of independent reasoning depicts an understanding and readiness on their part with respect to engagement, as shown in the case based analysis below.

Participant Reasoning	Key words/phrases used	Vegetarian food is better	Non-vegetarian food is better	Other
<b>Personal preference</b>	"I like it."	R1, R4	R2	
<b>Health</b>	"More nutrition." "Proteins, vitamins." "Health" "Energy"	R1, R2, R4, R6, R8	R3, R5, R7, R12	
<b>Both</b>	"We should eat both."			R2, R3, R4, R5, R7, R9, R11
<b>Villagers eat vegetarian food while city-dwellers eat more non-vegetarian food.</b>				R4

**Table 2.** T1: Is it better to be a vegetarian or a non-vegetarian?  
R = Respondent

For T1, five students claimed that vegetarian food is better due to health reasons, and four students claimed non-vegetarian food is better for similar reasons. Their reasons across both stances involved key words like 'energy', 'proteins and vitamins', 'nutrition', etc. (See Table 2). This sort of a clustering may be observed in their responses to the other topics as well. In the case of video games (T2), the reasons that eight participants gave for the argument that video games are bad were related to studies or completion of homework or other work. The next type of arguments was related either to violence or health, both of which were also types that the informational cues readily countered. (See Table 3)

Participant Reasoning	Key words/phrases	Video games are good	Video games are bad	Other
<b>Hampers studies/Homework/ Work</b>	"They will not study." "Cannot concentrate in studies." "Not reading"		R1, R2, R3, R4, R6, R7, R9, R12	
<b>Wastes Time</b>			R2, R4	
<b>Violence</b>	"Interest in fighting" "Saying bad words" "Fight"		R1, R2, R5, R9	
<b>Health</b>	"Affect eyes" "Mind not peaceful" "Addicted"		R3, R5, R9, R11	
<b>Entertainment</b>	"Time pass" "Entertainment"	R7, R8, R10		
<b>Reprimand</b>	"Parents will scold us."		R7, R9	
<b>Can be good or bad</b>				R9
<b>Lack of knowledge</b>	"I don't know" "I don't play"			R1, R3, R5

**Table 3.** T2: Are video games good for us or bad for us?  
R= Respondent



Participant Reasoning	Key words/phrases	Supermarkets are better.	Local markets are better.	Other
Distance	"Supermarkets are far."		R1, R5, R7	
Affordability	"People don't have money" "Costly" "Cheaper"		R1, R2, R4, R9, R11	
Variety	"Variety" "All"	R3, R6	R1	
Fresh Vegetables	"Fresh" "Dirty vegetables" <i>in local markets due to</i> "pollution, dust on the road" "Vegetables not covered"	R1, R5, R7, R8, R10	R12	
Economic divide	"For rich people, they will go to supermarkets"			R2, R3, R4, R8
Efficiency	"Take much time in local markets"	R3, R6, R7, R8		
Flexibility			R4	
Development	"Farmers are poor"		R9, R11	

**Table 4.** T3: Is it better to have supermarkets or local markets in the city?  
R= Respondent

For the third topic, the clustering can be seen as divided between four reason-types (See Table 4). Five participants state affordability as the reason local markets are better. Five of them who, at some point, wished to argue for supermarkets being better, state the reason as availability of fresh vegetables in supermarkets as opposed to local markets where vegetables may be “dirty” due to ongoing pollution on the road. Four participants state supermarkets and local markets as being meant for people with different economic backgrounds, and thus provide no clear orientation towards either. This last group could be according a multiplist nature (Kuhn, Cheney & Weinstock, 2000) to the category “better”, suggesting that comparing of the two entities would mean different things to people from different backgrounds, but the area requires more detailed study.

## CONCLUSION

The analysis of interactions with the participants demonstrates a conceptual engagement and evidence of presence of elements of argumentation in the defenses of their stances. The argument put forth by participants in the study were also reflective, to the extent that the design of the study allowed, of the sources that the participants’ arguments originated from. The responses of the participants stemmed from their personal experiences and prior knowledge, and this observation stands in line with studies that assign domain specificity to nature of argumentation in children (Kruglanski & Gigerenzer, 2011). This insight makes it imperative for the elements of the context of the child to be explored in line with the nature of argumentation. Their arguments also brought out a certain deeper epistemological understanding of multiplist kind of ‘knowing’ in them. This finding lends a hand for teaching practices that may be based on understanding how children’s epistemologies can have a non-absolutist (possibly empathetic) nature, rendering complexity to the scope of their learning. Further research, thus, would require looking into the nature of arguments children offer in

argumentation and the sources of it, sources of inhibitions that children face in scenarios of argumentation, and contextual and content-related cues and determinants of the epistemological process of meaning making in children.

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