

**Colette Dufresne-Tassé**  
Université de Montréal

**Kim Chi Dao**  
Télé-Université  
(Montréal)

**Thérèse Lapointe**  
Université de Montréal

# **Cognitive Functioning Indicated in Questions Asked by the Adult Visitor to the Museum<sup>1</sup>**

## **Abstract**

*It is believed that, in the museum, the questions of the adult are one of the best signs of an active and learning visitor. This opinion comes from what is known about school children; in fact, there seems to be no systematic study of the adult's questions stimulated by a museum object. An exploratory research was designed to identify the kinds of questions asked. The data collected indicate that, in the museum, an unanswered question, far from stimulating the cognitive and affective functioning, seriously disturbs it, and that the heuristic process is much more demanding in the museum than at school. Therefore, it seems that, in order to stimulate adult cognitive development, questioning should be handled in a very skillful way by the museum educator.*

## **Résumé**

*Dans le milieu muséal, on croit que les questions que se pose un adulte sont l'un des meilleurs indices d'un visiteur actif et qui apprend. Cette opinion vient de ce que l'on sait sur le comportement de l'enfant en classe. En fait, il ne semble pas exister d'étude systématique du questionnement du visiteur adulte au musée. Une recherche exploratoire*

*semblait donc appropriée. Ses résultats indiquent qu'au musée, l'accumulation de questions sans réponse immédiate, loin de stimuler le fonctionnement cognitif et affectif, le perturbe et que le processus heuristique est beaucoup plus exigeant au musée qu'à l'école. Il semble donc que pour être l'occasion d'un développement cognitif, le questionnement du visiteur adulte au musée doit être manipulé avec beaucoup de doigté par l'éducateur muséal.*

It has been noted that adult visitors are active if the object they observe corresponds with their concerns and interests (Dufresne-Tassé, Lapointe, Lefèbre, forthcoming; Hopper-Greenhill, 1983). The object corresponding with their tastes attracts their attention (Chase, 1975) and sometimes even excites their wonder (Chase, 1975; Lewis, 1980). Once triggered, the visitor's activity must be supported and maintained (Alt & Griggs, 1984), directed (Screven, 1978), and, for this purpose, methods of so-called silent pedagogy (Dobbs & Eisner, 1980) and strategies (Screven, 1978) have been developed.

According to museum educators, the questioning of visitors is one of the best indications of psychological activity and a proof that much is being learned (Henigar Shuh, 1982; Sanders, 1990). However, to our knowledge, educators have conducted no systematic study on the questioning of the adult visitor. They seem to have borrowed their position from educators in the school. The latter attach great importance to the questions of pupils or students, publish extensively on the subject (Dillon, 1982), but restrict themselves to pedagogical comments, as if they felt no need to back up their position with the results of systematic research (Dillon, 1982; Myiake & Norman, 1979). What role questions play in psychological functioning and in learning acquired in the museum is therefore really unknown. In view of this situation, we considered that the most appropriate research was of an exploratory type concerning the actual questioning of the visitor. Our intention was not so much to offer generalizable results as to identify an issue, as well as possible avenues, and an approach for research.

First we shall define the term "question", then give a brief description of the study undertaken, its results, and the meanings we attribute to them.

### **Meaning of the Term 'Question'**

It is believed that questions appear when visitors realize they lack information for pursuing the cognitive activity in which they are engaged. These questions are addressed to themselves, and they expect to answer

them themselves. Kearsley (1976) calls them "covert nonverbal". This conception of questions corresponds with the definition elaborated by Hintikka (1974): a request for information aimed to fill a gap in knowledge revealed by a situation. On the basis of the results described hereafter, it will be possible to assess the accuracy of this definition.

If we are right, adults' questions in the museum differ from their questions in class. There, they usually address them to another person, a teacher, because, in a classroom, their aim is often to obtain the information they need or indications as to how to acquire it. But, in addition, as in a conversation, their intention may be to verify the interlocutors' understanding and knowledge, stimulate them, control their discourse, or, on the contrary, to express attitudes or sentiments (Kearsley, 1976).

### Description of the Study

An analysis was made of the questions of 45 adults (20 men and 25 women), who were visiting an exhibition of molluscs in a natural science museum in Montreal, the Musée Georges Préfontaine. These persons were Montrealers, aged 25 to 65, having three different levels of education: secondary studies or less (15), college or university studies (15), a first-cycle university training in biology (15). They varied in museum attendance habits ranging from "never before" to "several times a year".

Upon their arrival at the museum, these people were told that no one really knows the nature of the experience produced by a visit, and we asked them to reveal, as they went around, what they were seeing, thinking, or feeling. We accompanied them during their visit and taped their remarks. We then transcribed the content of these tapes. It is on these transcriptions that our study is based.

As suggested by Miles and Huberman (1984), categories of analysis were identified from successive readings of the texts. We then checked the accuracy of these categories on five texts before using them to analyze the whole set. Once this checking was done, we had a frame which allowed us to study all the material collected from the viewpoint of the visitors' cognitive, emotional, and sensory functionings (Dufresne-Tassé, Lapointe, & Morelli, 1991). With the help of this frame, we identified the interrogative comments made by the 45 visitors. These are the comments that were considered as their questions.

The presentation of the molluscs was as simple as possible. They were displayed in cases by groups of 7 or 8. The gastropod or bivalve

specimens were set on stands varying in height to create a rhythm. The stands and the sides of the cases were covered in ultramarine-blue silk. Each stand bore a white card on which the Latin name of the mollusc, its common name, and its provenance were inscribed. On its upper edge, each case bore a notice: GASTROPOD or BIVALVE, according to its contents.

This presentation had been chosen purposely. It is the type of presentation usually found in most natural science museums, but also in fine arts, history, and anthropology museums. It is also the type of presentation which offers the least information and context, and the greatest constancy throughout an exhibition. It enables the visitors' experience to be studied not only with regard to what seems to them to be lacking but also with regard to what it offers, and to analyze the evolution of this experience during the visit.

## Results

In view of the exploratory nature of this research, we thought it appropriate to present the results in the order in which we obtained them: differences between the groups of visitors due to their types of education; number, orientation, and nature of the questions asked by the 45 visitors; evolution of these characteristics with the visit; and the relationship with the elements of the experience preceding or following a question.

### *Intergroup variation*

*Proportion of visitors of each educational type who ask themselves questions.* In the group that had only a secondary education, 73.3% of the visitors asked themselves one or more questions. In the other two groups, where the visitors had either a college or university education or training in the natural sciences, 93.3% and 86.6% did so. Although considerable, the difference between the first and the other two groups is not significant<sup>2</sup> at the .05 level ( $\chi^2 = .40$ ). For 2 degrees of freedom, with a two-tailed test, the minimum value of  $\chi^2$  is 5.99. It may therefore be considered, on this point, that the 45 visitors formed but one group.

*Number of questions of the visitors of each of the three types of education.* In the group that had no more than a secondary education, the visitors asked themselves an average of 2.86 questions (see Table 1); the other two groups averaged 2.46 and 4.26. The group with a training in biology thus asked almost twice as many questions as the two others. However, the variations around the three means are so great (see Table 1) that the difference between this group and the two others is not significant. Here as above, we must therefore consider that the 45 visitors form only one group.

Table 1

*Variation of the number of questions by visitors' education*

Type of Education	Questions			Type of Education	t*
	N	M	$\sigma$		
Secondary or less	43	2.86	2.22	Secondary or less/ College or university	.276
College or university	37	2.46	1.70	College or university/ Speciality in biology	.733
Speciality in biology	64	4.26	4.43	Secondary or less/ Speciality in biology	.546
<b>Total</b>	<b>144</b>				

\* For a significance level of .05, when the number of degrees of freedom is 28 and the situation is a two-tailed test, the *t* ratio is 2.048.

Our results contradict what was suggested by the theory of Bourdieu and Darbel (1969) and that of Myiake and Norman (1979). Based on the former, we would expect it to be the group with a biology background that would ask the most questions, because this is the group that has accumulated the widest culture on shells. According to the theory of Myiake and Norman, we would expect it to be, on the contrary, the group with a university education, because the person who does not have even a secondary education does not have the necessary knowledge to ask questions, while the one with a training in biology does not have to ask questions because he already has the necessary knowledge. Actually, we believe that our results may be explained by the fact that even a Montrealer with little schooling knows quite a lot about shells.

We have shown elsewhere that neither age nor sex seems to determine differences of general cognitive functioning among the 45 visitors of this study (Dufresne-Tassé, 1989). This also applies to their museum attendance habits. But in this latter case, the uneven distribution of habits in this sample (10 "never before", 32 "once or twice a year", and 3 "more") makes it difficult to estimate whether differences in habit are accompanied by differences in psychological functioning.

Thus, it is preferable to treat the 45 visitors as an undifferentiated group. The very strong intergroup variation observed leads us to think,

however, that certain factors other than socio-economic ones have a profound effect on the visitors' psychological experience.

### *Frequency of questions*

*Proportion of visitors who question themselves and number of questions per visitor.* In all, 38 visitors out of 45, or 84.4%, asked themselves one or more questions. Their total production was 144. The average per person is 3.2, while the mode is 3. At first sight, this number seems low, but the absence of other studies on the subject prevents any serious evaluation and interpretation of this observation. Because of the great difference in context and age, it does not seem appropriate to compare our results with those reported by Suskind (1969): in elementary science or social science courses, students asked an average of two questions per hour.

Finally, the number of questions per visitor varies from 0 to 17, which represents a wide variation. The standard deviation (3.2) illustrates its magnitude.

The above data reveal that most of the visitors formulated questions, that they tended to formulate a small number of them, but that this tendency is not general, since a certain number formulated a dozen or more.

### *Orientation of questions*

We used the term "orientation" to describe what the question aims at, and we distinguished two types of orientation: general and specific.

*General orientation.* We identified four targets for the questions: the object exhibited, the presentation the museum makes of it, the visitor and his functioning, and the conditions created by the study. Here are four questions which illustrate each of these targets:

*What's it called? (object)*

*I'd be curious to know why those six there or those five there have been put together, and these put together, d'you see, because usually in animal classifications like that you have to have a reason for putting them together, apart from the fact that it looks nice. (presentation)*

*Do you have any French visitors? (visitor)*

*It's me who sets the pace? (conditions created by the study).*

The proportion of questions per target reads as follows (see Table 2): 70.8% concern the museum object, 15.3% the conditions of the research in which the person is participating, 9.7% the presentation of the objects, and

4.2% the visitor. If the questions concerning the study and its methods are subtracted from the total, the following percentages are obtained: 83.6% focus on the object, 11.5% on its presentation, and 4.9% on the visitor.

**Table 2**

*Distribution of questions by visitors' general orientation*

Orientation	Number of Questions	<i>M</i> Visitor	$\sigma$	%
Museum object	102	2.26	2.82	70.8
Presentation	14	0.31	0.72	9.7
Visitor	6	0.13	0.40	4.2
Conditions created by the study	22	0.48	0.86	15.3
<b>Total</b>	<b>144</b>			

The only interrogatory statements addressed to a third party concern the details of the research. They are all prompted by the special conditions under which the visit took place. This observation confirms one of the two aspects of the definition proposed above: at the museum, solitary visitors address their questions to themselves and expect to reply themselves. All the other interrogatory statements indicate a wish for additional information elicited directly or indirectly by observations. This second observation corroborates the other aspect of the definition: the questions convey a lack of information for pursuing a cognitive activity in which the visitor engages. Thus, the proposed definition corresponds well with the characteristics of the material studied in this research.

*Specific orientation.* When visitors are interested in the object or sometimes even in the presentation that the museum has made of it, their questions may focus on either characteristics that are visible in the museum, or on nonvisible characteristics. For example:

*Where do the colours you see on the shells come from?*  
(visible characteristics)

Table 3

*Evolution during the visit of questions concerning the present/absent aspects of the objects or their presentation*

Type of education	All questions (N=113)			Questions on present aspects (N=45)			Questions on absent aspects (N=68)		
	1st period	2nd period	3rd period	1st period	2nd period	3rd period	1st period	2nd period	3rd period
Secondary or less	60.0%	33.3%	6.7%	71.4%	28.6%	–	56.5%	34.8%	8.7%
College or university	55.1%	27.6%	17.3%	46.2%	46.2%	7.6%	62.5%	12.5%	25.0%
Specialty in biology	44.4%	29.7%	25.9%	44.4%	25.9%	29.7%	44.5%	33.3%	22.2%
Whole group of 45 visitors	51.3%	30.1%	18.6%	51.1%	33.3%	15.6%	51.4%	28.0%	20.6%
$\chi^2$ (1st, 2nd, 3rd period)	11.88*			8.52*			10.64*		

\* For 2 *df*, the value of  $\chi^2$  at .05 significance level is 5.99



*I'd like to know what they eat, but also if you can eat them?*  
(nonvisible characteristics, the shells being exhibited empty)

To study this aspect of the orientation of the questions, we have subtracted from the whole set (144) those questions which did not involve such an alternative: the 22 on the details of the research, the 6 on the visitor, and 3 of the 14 on the presentation; thus, the analysis focused on 113 units. This analysis reveals that the questions about visible aspects (45) represent only 39.8%, while the questions on nonvisible aspects (68) represent 60.2% (see Table 3).

*Significance of the two types of questions.* Whether they relate to a visible aspect or to a nonvisible aspect of the exhibits, the 113 questions imply a movement surpassing mere observation, an intellectual and emotional commitment of the visitor. But the resemblance between the two kinds of questions ends there.

A question on visible aspects calls directly on cognitive functioning, mostly reasoning, aimed to consolidate or enrich what the visitors have sought out in their observation. This functioning leads to a structuring and deepening of the field identified in the perception. We are tempted to call this exploration vertical.

Such an orientation exerts strong pressure on visitors whether or not they decide to carry out the procedure which would bring a reply. If they do not take this step, they encounter frustration: they stop a movement, block an intellectual and emotional investment, and face an unsatisfied need to know. If they proceed, they encounter fear. Unless they can rapidly find a ready-made reply in a near-by exhibit, they must take indirect steps to guide their search in a difficult and random context, for the level of their knowledge is sometimes very different from that of the information transmitted by the exhibits; they must then find the necessary knowledge to initiate and carry through their exploration. At both moments, they must envisage error, failure, and the possibility of having given themselves trouble for nothing.

Since the visitors do not usually come to the museum to find replies to precise questions, it is surprising that they place themselves so frequently in such a demanding situation. Is this because their curiosity is so strong that they are caught by the questioning, not realizing the consequences? If we are right, the number of questions about visible aspects should decrease as the visit progresses, if there are no answers immediately at hand.

In the light of the above, the museum situation proves very different from the school situation. In the latter, adults are seldom asked to adopt an

inductive procedure and, when they are, the teacher helps them eventually to choose an approach, gives them the missing information, or tells them where they can find it. In other words, the teacher traces the students' whole program - not to mention that its completion is supported by positive and negative sanctions (diploma-failure).

A question on nonvisible aspects means something quite different. Such a question reorients the exploration, launching it in a different direction. It leads to a widening of the field identified in the perception. For these reasons, we describe it as horizontal. Unless the visitors find a near-by exhibit responding to their question, since they are changing course and must proceed without immediate data, they have little chance of finding a reply. Do they understand this? Are they not rather side-tracked by some association? We cannot say. But we have observed that in 75% of cases, a question about a nonvisible aspect is followed by an imaginary activity: evocation of memories related in some way to the subject of the question that has emerged.

It looks as if the questions on nonvisible aspects gave access to an unconstrained universe, but one which brings the visitors back to themselves. Such a functioning probably does not exert the pressures on the visitor which accompany the questions on visible aspects. Is this what explains, in this study, the clear preponderance of the questions targeting nonvisible aspects over questions targeting visible aspects? Is this a constant phenomenon, easily influenced by the type of presentation of the objects? Here, it may be thought that the phenomenon is amplified by a presentation of museum objects which, at least in the visitors' eyes, offers no reply to their questions.

If we are right, as time goes by, visitors should be less and less interested in asking questions about visible aspects because they realize that obtaining replies is too demanding; they should also be less interested in asking questions on nonvisible aspects because they have exhausted the reserves of their imagination about the molluscs as presented. Thus, at the end of the visit, a considerable decrease in the questions of both kinds should be observed.

### *Nature of the questions*

In a former study (Dufresne-Tassé, Lapointe, Morelli, forthcoming), it was established that the visitors process their whole experience by means of 12 intellectual operations: manifesting, noting-describing, identifying, remembering, associating, distinguishing-comparing, grasping, explaining-justifying, resolving-modifying-suggesting, orienting, checking, evaluat-

ing. The nature of a question is the aim pursued by visitors when they perform one or the other of these operations.

The questions asked by the 45 visitors had four aims: to identify, to describe, to explain, and to verify. Here are some examples:

*I'd like to know where they come from?* (identify)  
*How does it grow?* (describe)  
*How come that one has a hole like that, but that one there has another hole of another shape?* (explain)  
*Are these mussels the kind you eat, or aren't they?* (verification).

Nearly three-quarters of the 144 questions (101; 70.1%) aim to verify what visitors know or think about the objects they observe (see Table 4). The remainder try to identify the characteristics of these objects (22; 15.3%), obtain a description (11; 7.7%), or an explanation (10; 6.9%) of them.

*Significance of the four types of question.* To request a description or an explanation assumes that the visitors are primarily interested in the object for what it is. This also applies to identification, except that, in this case, we also find the desire to situate the observed object within a world view, or, if so preferred, within the mental schemas that structure it. On the other hand, verifying implies detachment from the observed object. Even though a verification has been triggered by this object, the major interest lies not in this object but in the visitors' knowledge. In other words, whereas in the questions of identification, description, or explanation, visitors focus mainly on the object, in questions of verification, they focus on themselves. While the first three types of questions give them the opportunity to enrich their cognitive schemas or to develop new ones, the fourth only allows them to check whether these schemas apply to the case they are observing. While the first three are directly oriented to the unknown - novelty, the fourth is only indirectly (only if the answer included in the question is contradicted by the content of the exhibit) and seldom so (the verifications gathered in this study are usually stated in the form of alternatives rather than mere replies).

In our view, verification can play three roles in the museum: (1) confirming knowledge acquired prior to the visit or, if preferred, testing cognitive schema; (2) second, in interaction with other types of cognitive operations, creating a sum of knowledge necessary for the exploration of the unknown offered by the museum situation; and (3) lastly, controlling the result of the exploration, the knowledge acquired during a visit, so as to permit its integration into the visitors' cognitive schemas. If we are right, when the presentation of exhibits permits the visitors to explore unknown

**Table 4*****Evolution of the number and of nature of visitors' questions during the visit***

Type of education	All questions (N=144)			Identifications (N=22) %/Number of questions of the period		
	1st period	2nd period	3rd period	1st period	2nd period	3rd period
Secondary or less	48.8%	30.2%	21.0%	9.5%	7.7%	—
College or university	48.6%	32.4%	19.0%	5.5%	—	—
Speciality in biology	42.2%	29.7%	28.1%	37.1%	21.0%	22.2%
Whole group of 45 visitors	45.9%	30.5%	23.6%	19.7%	11.4%	11.8%
$\chi^2$ (1st, 2nd, 3rd period)	8.77*					

\*For 2 *df*, the value of  $\chi^2$  at .05 significance level is 5.99

<b>Descriptions (N=11) %/Number of questions of the period</b>			<b>Explanations (N=10) %/Number of questions of the period</b>			<b>I+D+E (N=43) %/Number of questions of the period</b>			<b>Verifications (N=101) %/Number of questions of the period</b>		
1st period	2nd period	3rd period	1st period	2nd period	3rd period	1st period	2nd period	3rd period	1st period	2nd period	3rd period
14.3%	7.7%	–	14.4%	7.7%	–	38.1%	23.1%	–	61.9%	76.9%	100%
11.1%	8.3%	–	22.2%	–	–	38.9%	8.3%	–	61.1%	91.7%	100%
–	10.5%	11.1%	–	10.5%	–	37.1%	42.1%	33.3%	62.9%	57.9%	66.7%
7.6%	9.1%	5.9%	10.6%	6.8%	–	37.9%	27.2%	17.6%	62.1%	72.8%	82.4%
						13.1*			2.63%		

aspects of the objects they look at, their verifications should fit into a series of operations and a close and harmonious relationship should be observed between their verification questions and their other types of questions.

The disproportion observed in this study between the number of verification questions (101; see Table 4) and that of the other types of questions (43) is probably mainly due to the presentation of the objects used in this study. This presentation in fact offers no identification other than the Latin names, common names, and the provenance of the specimens - no description, no explanation of the phenomena specific to the life of molluscs.

If the explanation we have just formulated is accurate, since the presentation of the molluscs also provided a favourable situation for verifying knowledge predating the visit, a decrease should be observed in the number of identification, description, and explanation questions as the visit progresses, but maintenance of the number of verification questions. Moreover, we ought to see an ever-increasing isolation of the verification questions and of the questions of all sorts relating to what precedes or follows them, in other words, their isolation, an "explosion" of the functioning, and its fragmentation into disconnected units.

### *Evolution of the questions with the visit*

To study the evolution of the questions as the visit progressed, we divided the commentary of each of the 45 visitors into three equal parts. Strict rules of transcription from the oral to the written ensured constancy in the typing of the taped comments, so that the three parts into which the pages of each commentary is divided correspond accurately with a visitor's production during each third of the visit.

*Evolution of the nature of the questions.* As anticipated, the identification, description, and explanation questions decrease from the first to the third part of the visit. While they represented 37.9% of the questions during the first period, they represent no more than 27.2% in the second, and 17.6% in the third. The difference is important and significant (see Table 4). During this time, the verification questions increase - from 62.1% in the first period, to 72.8% in the second, and to 82.4% in the third. Although this increase is considerable, it is not significant (see Table 4).

If our understanding of these observations is correct, the evolution of the two types of questions should indicate a gradual lack of integration of the verification questions with the other types of questions and with the rest of the visitor's cognitive functioning. We believe that reduced interdependence deprives the visitor's whole functioning of a dynamic element. What

is the factor responsible for this decline? Was it the psychological characteristics of the visitors who participated in this research? In view of the variety of the visitors in this study and the similarity of their evolution (see Table 4), we are tempted to attribute this evolution to the type of presentation. (The data at our disposal do not permit the study of the interaction between these two factors.) The little opportunity visitors have of finding an answer to their questions from what they see in the museum may gradually discourage them from asking any, lead them to fall back on questions which involve their own knowledge rather than the objects they observe, and isolate questioning from the rest of their cognitive functioning. To test this explanation, we studied the general evolution of the questions. Whether we considered the whole set of 144 or the 113 that focused on the object and its presentation (see Tables 3 and 4), we observed a falling off in the questions from the first to the last third of the visit; at the end, they had decreased by at least half, the differences being significant.

*Evolution of what precedes and what follows a question.* To study the 45 commentaries, they were divided into successive statements. We were thus able to identify what preceded and what followed a question, and to establish a connection between these elements and the question. The statements might correspond with any of the 12 operations mentioned above. They were arranged into two categories: "related to the question" and "unrelated to the question". The most frequent cases of a connection were represented by operations aimed at justifying a question, developing it, or trying to reply to it. The results are shown in Table 5.

Generally speaking, whereas the proportion of unrelated elements remains more or less stable throughout the visit, that of the related elements falls off markedly from the first to the third part, and this evolution applies equally to what precedes or to what follows a question. (The unrelated elements which precede a question drop from 46.2% to 26.9%, which does not constitute a significant difference; those which follow a question drop from 42.7% to 26.8% and to 30.5%, which does not constitute a significant difference. During this time, the related elements which precede a question drop from 45.4% to 34.9% and to 19.7%, which constitutes a significant difference, and those which follow a question drop from 50% to 35.4% and to 14.6%, which also constitutes a significant difference). As the visit progressed, the visitors' questions thus seemed to be more and more isolated from the rest of their cognitive functioning.

### Summary of the Results

The integration of the preceding observations and the significance we have attributed to them leads us to describe questioning as follows. Adults who visit an exhibition of molluscs in a natural science museum presented

Table 5

*Evolution during the visit of what precedes and follows a question*

Type of Education	% of questions preceded by an element which						% of questions followed by an element which					
	is related to them			is unrelated to them			is related to them			is unrelated to them		
	1st period	2nd period	3rd period	1st period	2nd period	3rd period	1st period	2nd period	3rd period	1st period	2nd period	3rd period
Secondary or less	52.6%	21.1%	26.3%	45.8%	37.5%	16.7%	62.5%	25.0%	12.5%	40.7%	33.3%	26.0%
College or university	47.1%	47.1%	5.8%	50.0%	20.0%	30.0%	61.1%	27.8%	11.1%	36.8%	36.8%	26.4%
Specialty in biology	40.0%	36.7%	23.3%	44.1%	23.5%	32.4%	35.7%	46.4%	17.9%	47.2%	16.7%	36.1%
Whole group of 45 visitors	45.4%	34.9%	19.7%	46.2%	26.9%	26.9%	50.0%	35.4%	14.6%	42.7%	26.8%	30.5%
$\chi^2$ (1st, 2nd, 3rd period)	6.62*			5.75			11.87*			3.38		

\* For 2 *df*, the value of  $\chi^2$  at .05 significance level is 5.99



with no information other than the scientific name, the common name, and the provenance of each specimen generally ask a small number of questions to which they expect to reply themselves. These questions represent for them missing information that is needed for the pursuit of a cognitive activity which they have initiated, usually based on their observations. These questions focus mainly on properties of the objects that are not visible in the presentation made of them by the museum and are aimed at the visitors' own knowledge of what they are looking at.

The total number of questions decreases considerably from the beginning to the end of the visit. This decrease in questions as the visit progresses indicates, in our view, a decrease in what Berlyne (1963) and Voss and Keller (1983) call epistemic curiosity. This decrease would probably be accompanied by a deterioration in two other aspects of psychological functioning: a lesser capacity for recourse to the imagination and lesser cognitive daring. During this time, the objects that attract visitors, and hold their attention, interest them less and less for their novelty potential. They turn resolutely inwards, ask themselves about the accuracy of their own knowledge, and their cognitive operations, which are increasingly disjointed and independent of one another, lose much of their power.

We have good reason to believe that the evolution of the questioning observed in this study is mainly caused by the characteristics of a classical display of the objects observed by the visitors.

### Discussion

The results presented pose three basic problems that should be discussed.

1. The observations made in this research show that visitors' questions sometimes exert such a pressure on their psychological functioning that they disturb it. In the museum, questions do not therefore necessarily have a positive significance as at school. These observations raise the problem of the relationship between museum pedagogy and school pedagogy. Must museum pedagogy be a mere adaptation of school pedagogy or, on the contrary, must it constitute an original praxis?

2. The absence in this study of differences between the numbers of questions produced by persons of three different educational levels raises a concern that has long preoccupied museum educators, that is the factors responsible for the visitors' psychological functioning.

The study by Bourdieu and Darbel (1969)<sup>3</sup> and that of Di Maggio and Useem (1977)<sup>3</sup> emphasize the importance of the visitors' socio-cultural

characteristics as determinants of their functioning. That of Chamberland and Dufresne-Tassé (forthcoming) focus on the way in which visitors elaborate a context for an object they observe<sup>4</sup>, in other words, their way of giving it meaning, so emphasizing the influence of the visitors' psychological characteristics. Lastly, in the present study, although we have not established any direct link between the museum presentation of an object and the visitor's functioning, the phenomena we observed as the visit progressed suggest that the presentation shapes the visitors' functioning and, in all likelihood, the benefits they may derive from a visit to the museum, as well as their level of satisfaction.

We believe that the visitors' socio-cultural level and psychological characteristics and the type of presentation of the objects are three factors which interact in numerous ways. For example, visitors of a given socio-cultural level will have a highly developed cognitive functioning with regard to a particular exhibition because its presentation favours a functioning that is easy for them. They will derive such satisfaction from it that their functioning will be increasingly enriched as the visit progresses. Other persons of the same socio-cultural level, who spontaneously choose another functioning - especially an affective functioning - will feel unattracted by the type of exhibition, will probably have avoided it previously, will not have developed skills permitting them to derive profit from it, and will feel at a loss the day they will have to face such an exhibition. Either they will adjust and change their approach, or they will accept that, as their visit progresses, their functioning deteriorates and their satisfaction declines.

We think it is important to develop a descriptive model of the influence of the three factors considered. This model should take account of interactions such as those we have just mentioned. It should also adopt as its core element the visitor's psychological functioning and its relationship with the profit derived from a visit or with the satisfaction it procures, rather than the visitor's "behaviour", as represented by indicators of attracting power or retaining power.

3. If a model is developed, having the visitor's psychological functioning as its core element, can the study of this functioning be limited to its cognitive aspect only? We think not, since one of the main goals of a museologist is to give an opinion on the value of an exhibition. The study of the results presented above shows this. It was possible to observe a deterioration of certain aspects of the visitors' cognitive functioning, in particular, a decrease in their recourse to imagination and reasoning. In our view, this information is insufficient. It is simply the anchor point for a series of questions. For example: What has happened to the rest of the cognitive functioning? Have the visitors' operations of comparison and evaluation been maintained? What has happened to the visitors' affective

functioning and to their sensory functioning? Could the visitors have adapted themselves to the presentation of the objects used in this study by enhancing their interest in the aesthetic aspect of the shells, thus nonetheless deriving important benefits from what they observed? Could only certain visitors have achieved this adjustment? Could they have done so successfully because, for them, the aesthetic emotion almost completely excludes any complex rational functioning? What has happened to the others; has the deterioration in their cognitive functioning caused the deterioration of their affective and sensory functioning?

In short, we believe that a model having the visitor's psychological functioning as its core element must consider its cognitive, affective, and sensory aspects. Such a requirement implies the development of an approach and an instrument which permits the analysis of these three aspects. It also assumes that a thematic study of the learning or questioning involved, as was the case here, always requires an additional element - an analysis of the rest of the visitor's psychological experience.

## NOTES

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- <sup>2</sup> The level of significance used in this research is .05.
- <sup>3</sup> Studies conducted in fine arts museums.
- <sup>4</sup> Studies conducted in a natural science museum.

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*Colette Dufresne-Tassé* holds doctorates in psychology and sociology. She has been the Head of the andragogy program at the Université de Montréal. She was president of the Canadian Association for the Study of Adult Education (1990-91) and is at present the president of the Canadian Educational Research Association.

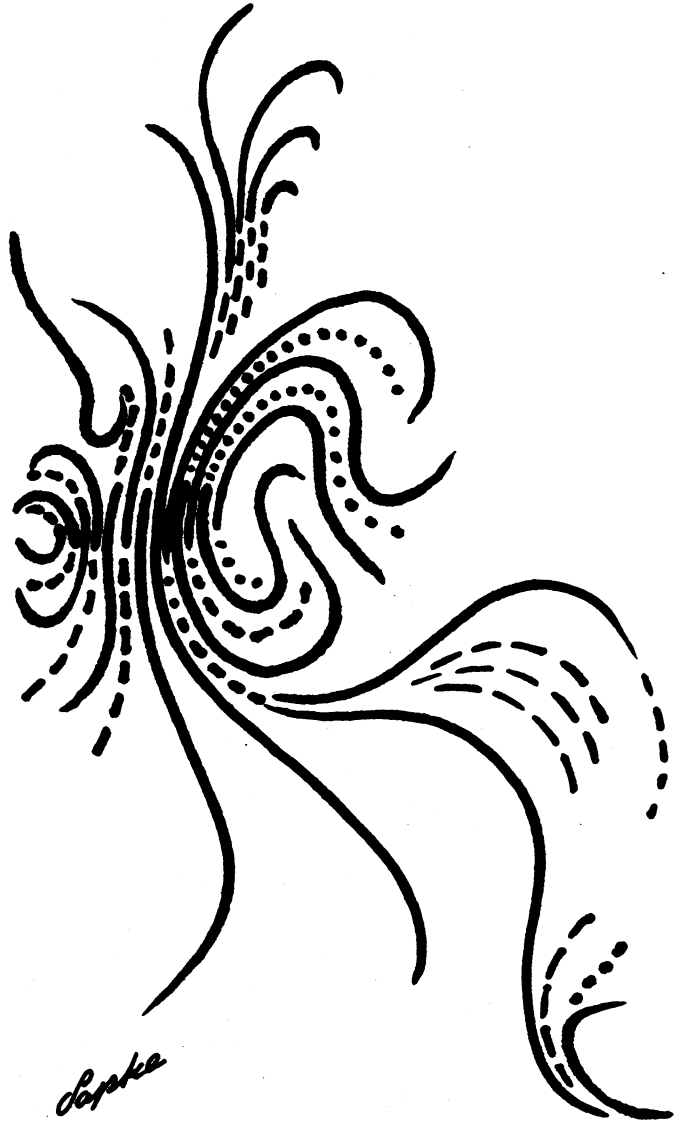
*Kim Chi Dao*, M.A., is a professor associated with Télé-Université in Montreal.

*Thérèse Lapointe* is a research assistant at the Université de Montréal.

*Colette Dufresne-Tassé* est titulaire de doctorats en psychologie et en sociologie. Elle a dirigé le Programme d'andragogie à l'Université de Montréal. Elle a été présidente de l'Association canadienne pour l'étude de l'éducation des adultes (1990-1991) et est actuellement présidente de l'Association canadienne des chercheurs en éducation.

*Kim Chi Dao*, M.A., est professeur rattachée à la Télé-université à Montréal.

*Thérèse Lapointe* est chargée de recherche à l'Université de Montréal.



Lapaka