

# MAMMOTH-MAGAZINE

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THE OFFICIAL  
MAGAZINE OF  
THE CENTRE FOR  
STUDIES ON HU-  
MAN STRESS

The Centre for  
Studies on  
Human Stress is  
dedicated to  
improving the  
physical and  
mental health of  
individuals by  
empowering  
them with sci-  
entificall  
y grounded  
information on  
the effects of  
stress on the  
brain and body.



## Young Children in Daycare : Stressed Out and Less Attached to Mom?

### Editorial : On the responsibilities of Scientists

By Tania Elaine Schramek, Associate Editor



Welcome to the latest issue of Mammoth-Magazine! Although we have outlined the mission of the Centre for Studies on Human Stress in our first issue, we would like to begin this issue by expanding a little more on one of the driving forces behind the creation of the Centre; our duty as scientists.

With the position of 'scientist' come important responsibilities and obligations. The research questions we pose must have a strong theoretical backdrop and have 'real' importance. In other words, we have to demonstrate that the question we are asking makes sense and that we need to answer it in order to advance knowledge in the field in a way that will eventually help the public. We are obli-

gated to share the results of our experiments with our peers by publishing them in scientific journals. Finally, we must make our results and their implications known to the public with the help of the media, public conferences, and sometimes the publication of books. After all, your hard-earned tax dollars are what support our research studies which are designed to benefit us all!

Of critical importance in science is the notion of peer review. What this means is that before we can even conduct a study, other scientists and specialists in ethics go over our proposed protocols to ensure that they are sound. Once the study is completed, other scientists (at least 3) who specialize in the

same field must go over our research methodology to ensure that we conducted our study correctly and according to the tenets of the scientific method and also, and perhaps most importantly, they make sure that we are interpreting the data correctly. Only then, after this rigorous peer review process can we publicize our findings.

Why do we submit ourselves to this process? Simply put, this is the only responsible way to conduct science. This statement may sound harsh but as you will see in the first article in this issue by Marie-France Marin, the results of scientific studies and how they are interpreted and conveyed to the public can have an important impact on the lives of individuals.

Clearly, scientists cannot take their responsibility to the public lightly. Moreover, we simply cannot be an objective judge of our own work, hence why we have peer review. This process does not make us immune to making mistakes, but it does however considerably reduce this probability. This is also in part how scientists establish their credibility within their respective fields.

### Lost in Translation

As mentioned earlier, scientists often rely on the media to render public important research findings. All told, everyone does their best to get the right message out to the public, but sometimes important information simply gets lost in translation. Why is this the case?

Researchers typically work in institutions such as universities, hospitals, and private industry each of which has communications/public relations (PR) departments that deal with the press. The way things work is that the researchers let the PR people know that they recently found something of interest to the public in their work. The researcher explains the study to the PR people, then, the PR people write a press release that is sent out to the media (newspaper, radio, television) to try to attract their attention. To do this, the message must have a good spin. The media then contact the PR people and try to set up an interview with the scientist. The interview takes place, the media write their piece, their editor/producer goes through it and then it is made public. The scientist often does not know what the end result will be.

As you can see, in any of these steps the message can change. Sometimes the scientist is not the best at describing his/her work in a clear manner without using highly specialized scientific jargon rendering the PR person's work difficult. There are times when the researcher is clear but the PR people don't get it, or the media gets it wrong... pick your possible permutation... There are many!

Alternatively, scientist themselves can take the message directly to the public by writing lay language

books. Researchers develop their expertise by conducting many studies in their respective research areas and by learning from the work of other scientists. They take this accumulated knowledge and bring it to the public. There are many good books out there but unfortunately there are also those that may misrepresent the state of the current knowledge in a given field. In the second article of this issue of Mammoth Magazine, an article by Sonia Lupien Ph.D. and her colleagues will provide an example of such an occurrence.

### Our mission continued...Knowledge Translation

We take very seriously (as do most scientists) our obligation to share our knowledge with the public. Accordingly, we sought to do so through our website [www.douglas.qc.ca/stress](http://www.douglas.qc.ca/stress), Mammoth Magazine, and our public conferences. We try to the best of our abilities to render accessible information that was obtained using the scientific method, reviewed by our peers, and that is well-accepted in our field of specialty; stress.

For instance, Marie-Claude Geoffroy, who specializes in stress in children, will provide us with an accurate view of the state of knowledge surrounding stress in children in daycare in the third article of this issue of Mammoth Magazine. This topic has received considerable media coverage as of late and as experts in the field of stress we feel that part of the message conveyed to the public does not accurately reflect what is generally agreed upon in our field.

We also feel that our responsibility to share knowledge with the public extends to providing tools with which individuals may become informed consumers of knowledge. Popular books and magazines do not undergo peer review and this is perfectly OK, we are not advocating a total shift in our information practices. That said however, the consumer can do a few things to ensure that the information they are getting comes from a reliable source.

One way to do this is to look for an opinion on this book in Book Review sections appearing in respected journals/magazines like Scientific American, Discover, and New Scientist (for the advanced reader) and even Amazon.com. A simple Google™ search on the author can tell us a lot. If they are published in scientific journals this is already a good sign, it means that at some point their work was reviewed by other specialists. To know this you will see that the links resulting from the search often have a university name in them, or the following: ncbi, pubmed, medline, psycinfo. These are databases for scientific articles. Just be sure that they have published on the same topics they discuss in their book!

On this note, we wish you good reading in this very informative issue of Mammoth Magazine. ❧



## Stress in Daycare : What are the Parents' Thoughts on this Issue?

By Marie-France Marin (Translation and Edition: Tania Schramek)

On September 17th 2006 the Centre for Studies on Human Stress opened its « window » to the public. The events of the official opening of the Centre comprised two general lectures and two forums in which the audience were the central players. The themes of these forums were as follows: “Day care before the age of 2: Is it really that stressful and potentially harmful for child attachment?” and “Do stressful workplaces exist and if so what do they look like?”. In addition, all present were asked to complete a short survey on the topic of stress in day care. As promised, here are the results of this survey and what we believe they are telling us on how the general public feels about the issue of early day care. We have selected a few questions in particular, however should you wish to see the results from the whole survey they will be available on our website [www.douglas.qc.ca/stress](http://www.douglas.qc.ca/stress)

### Who were the respondents?

One hundred and twenty-six people filled out our survey, 69% of which were women. Given the topic of the forum, we were interested in knowing whether or not our participants had children and also what percentage of individuals had children in the day care age-range (0-5). We found that 54% of women and 49% of men had had at least one child of their own. Only 15.5% however had a child in day care full time and 13.8% sent their kids to day care part-time. It is highly likely that the low number of parents with a child in day care results from the fact that the average age of our respondents was 45. So, what did they think?

## Does early day care cause aggression?

The day care debate indeed raised several points related to whether it is potentially harmful to send children to day care at a young age. One major issue for debate is whether day care at a young age can render a child more aggressive. Overall, 69% of men and 63% of women disagreed with this notion. Thus, 37% of women and 31% of men do feel that daycare at a young age may have the negative effect of greater aggression in children.

## Putting things into perspective

Some researchers indeed state that children who attend day care from an early age display more aggression because they are faced with the challenges of functioning within a small 'society' on a daily basis. Children share the day care environment with several of their age-matched peers and as a result must learn to share, wait their turn etc.

What some researchers call aggression others would qualify as learning how to take one's place. We must also try to keep in mind that humans are born with a certain degree of aggression, we needed some to make it here as a species and fight mammoths while doing so! Importantly though, the social context in which an individual evolves and his/her brain development both help to teach the individual how to keep this aggression in check.

If however, a child does engage in behaviours that are deemed unacceptable in the day care setting, it is essential that the caregiver address the behaviour (in a calm non-aggressive way) right away. This alone would under normal circumstances decrease the probability of it being expressed in the future. Thus, children learn what is considered acceptable and valued within a group and what is not, and this has to be pointed out and dealt with right away. This is also an example of one way by which society contributes to helping individuals manage their inherent aggression. Concurrent brain development also helps the individual to learn how to rationalize events and not always act upon one's instincts.

## At what age is the brain fully developed?

Given that brain development plays an important part in all this, we asked the respondents at what age they felt that the brain finished developing. Almost half of the participants (50% of men and 48% of women, notably the youngest of our participants) answered correctly; i.e., during late adolescence into early adulthood.

## Putting things into perspective

The brain is made up of multiple structures that develop at different rates. Some of these brain areas are more primitive and regulate most instinctual behaviours. For instance, the limbic system will respond to a threat in the environment by eliciting a fear response. What distinguishes us from other animals however, is our capacity to organize and integrate information, plan and reason. Functions such as these are those mediated by the frontal lobe. The development of this brain area underlies an individual's ability to rationalize events and can therefore in part help one to manage his/her aggression. The kicker is that the frontal lobes are not fully developed until adulthood.

Although controversial today, Freudian Psychoanalysis has nonetheless affected popular culture's view of how development takes place with generations believing that events taking place between the ages of 0-5 are what shape/determine who we become. This may in part explain why 50% of our respondents believe that the brain is fully developed at the age of 5.

Given that the frontal lobes are not fully developed until early adulthood and their critical role in organized thought, higher cognitive functions, and reasoning, it is highly unlikely that events occurring between the ages of 0-5 (although they are important) are solely responsible for shaping who we are.

## Is day care stressful, does it affect child attachment, and how do you know?

Our field of expertise is stress. It stands to reason therefore that we asked our participants whether they thought that day care at an early age is stressful. 69% of women and 64% of men believed that it can be. We were also interested in finding out what aspects of being in daycare could be stressful to infants and toddlers. An overwhelming majority reported that the number of hours a child spends in day care is the most important source of stress. Coming a close second and third were noise levels in day care and the fact that the caregiver is not the mother.

Further still, we asked if day care at an early age negatively affects how children form attachments with their mother. Most surveyed did not believe this to be the case but at least one quarter (27%) of women and one third of men (34%) reported that it can. We also wanted to ascertain what fueled their opinion. So we asked participants to tell us what shaped their response; personal experience or external sources of information about child attachment.

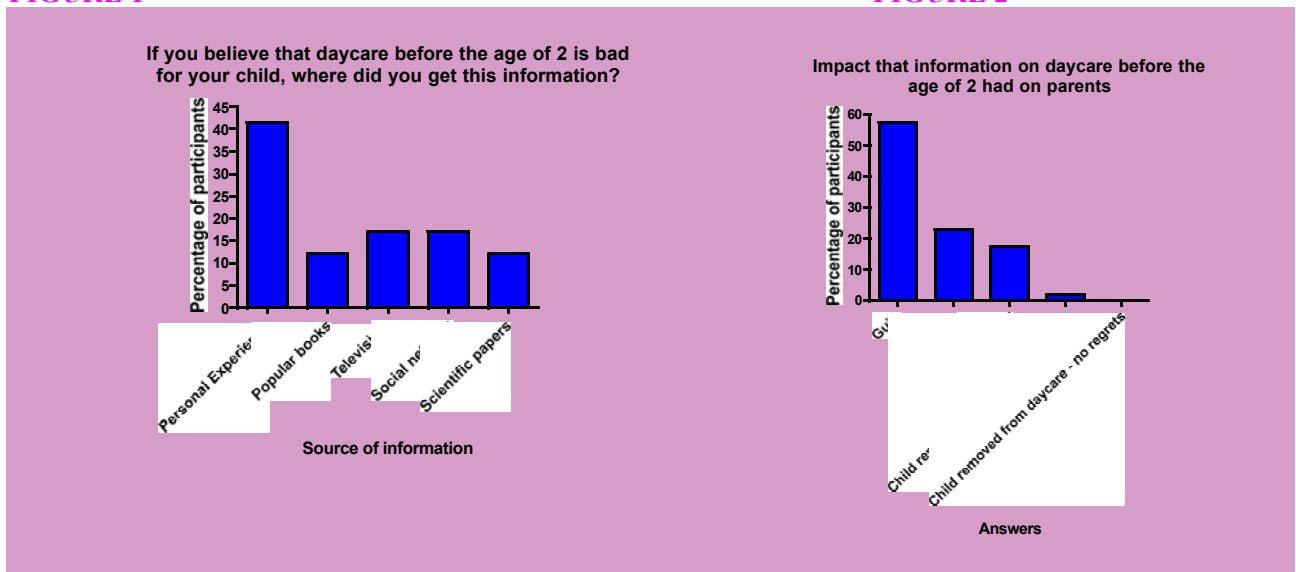
As shown in Figure 1, 40% of individuals based their idea on personal experience, while the resulting 60% based their idea on reading popular books, watching TV, talking to friends or reading scientific papers. Lastly, we asked participants to indicate what effect, if any, the message sent by the various television reports, newspaper articles, popular books that recently appeared in the media has had on them. As shown in Figure 2, close to 60% of individuals stated that these various popular books and TV medias induced guilt, while close to 30% reported that it induced stress or disputes in the couple. Only a very small percentage of individuals (3%) reported that these popular books or TV

medias convinced them about the ‘dangers of daycare’ and so, they took out their child from daycare without any regret.

### Putting things into perspective

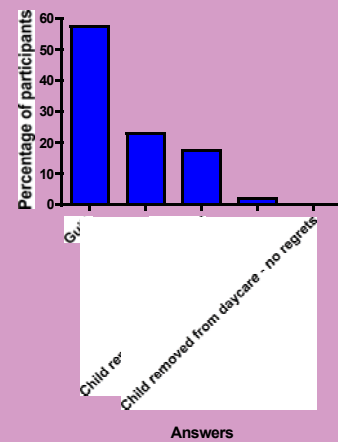
As parents it is important to keep in mind that our children are pretty perceptive and can sense when we are stressed. Thus, if taking our child to day care and trusting others with their care stresses us, it is possible that the context surrounding day care that would have been neutral to begin with can turn into something stressful. But the question here is why is it stressful to us? Recall that our survey showed that among the

**FIGURE 1**



**FIGURE 2**

Impact that information on daycare before the age of 2 had on parents



people who believe that day care is harmful for child attachment, over half of those polled base their opinions on information they have received from a variety of sources.

So, we cannot know where exactly the information came from. However, the results depicted in figure 2 show us that a good proportion of the population internalizes, at least in part, the information provided in the media and in popular books. In addition, our survey suggests that they can have effects on individuals’ perceptions and decisions. The most evident effect has been an increased sense of guilt by those parents who obtained their information about child attachment by external sources. We must ask ourselves whether these external sources of information were correct in their suggestions. How did they come to their

conclusions? What were the studies that have shown this?

In closing, although many of our respondents felt that early day care can affect child attachment based on their own convictions, it is noteworthy that information recently publicized in the media has had a negative impact on parents. For some, the news simply came to confirm what they previously thought. For others however, it has raised doubt and caused them to question whether they made the right decision by sending their child to day care before the age of 2. For these same individuals, this meant greater stress and feelings of guilt, neither of which can be good for their children.

The entirety of the report to which we refer here is available on our website. [↗](#)



## Scientists Setting the Records Straight : An Analysis of the Book : ‘The Baby and the Bath Water’

By **Sonia Lupien, Ph.D.** (McGill University); **Tania Schramek, M.Sc.** (McGill University); **Marie-Claude Geoffroy, M.Sc.** (University of Montreal); **Michael Meaney, Ph.D.** (McGill University); **Sylvana Côté, Ph.D.** (Université de Montréal) ; **Ellen Moss, Ph.D.** (Université du Québec à Montréal); **Sophie Parent, Ph.D.** (University of Montreal).

Over the past few years, various popular books have been published in Canada and in the United States describing the potentially negative impact of sending children below the age of 2 to daycare. Basically, what these books have been saying is that placing children in daycare at such a young age can have dramatic effects on the capacity of the child to attach to his/her mother, and can also lead to increased stress which can then have a negative impact on brain development. These books have been highly publicized by the media and have had a very strong impact on parents, leading to increased stress and feelings of guilt for putting their children in daycare at a young age (see the results of our survey in this issue of the Mammoth Magazine).

Writing and publishing scientific books for the public is an important endeavour. However, when doing so, one has to be certain to convey the right scientific information, and to have interpreted the data using the scientific method. Unfortunately, this is not always the case and when emotions, the will to ‘do the right

thing’, feelings of ‘saving the children’ and pride enter into play, then many scientific data can be distorted and reported in a way that can be misleading.

Since the Mammoth Magazine is based in Montreal, Quebec Canada, we have decided to use one of the most publicized books in our region on the topic of ‘Daycare before the age of 2’ and analyze the content and scientific facts described by the authors. By doing so, our goal is not to dismiss the authors of any given book, but to analyze whether the information provided to the public was accurate, whether it has been correctly interpreted, and whether all of the available information on the topic of stress, attachment, and daycare was provided to the public.

In 2006 a book entitled ‘Le bébé et l’eau du bain’ (in english : The baby and the bath water) was published by Dr. Jean-François Chicoine, Pediatrician and Nathalie Collard, Journalist. In essence, the book stated that parents should be aware of the fact that sci-

entific studies have shown that placing children in daycare before the age of 2 can lead to problems in mother-child attachment and lead to a large stress response that can have dramatic effects on the child's brain development. Obviously, a book with this type of information garnered immediate media coverage and had a very strong impact on the public. Radio stations organized public discussions on the topic and many parents called the stations to let them know whether they agreed or not with the central tenants of the book. The authors appeared on national television and summarized once again the scientific facts behind their statements and the book was a top-10 seller for many months to follow.

Now, what is the thesis of the book? Two important statements were made by the first author, Dr. Chicoine. First, he states that studies have shown that placing a child in daycare before the age of 2 can prevent the child from developing a secure attachment to his-her mother. Second he contends that daycare at a young age is deleterious to attachment because it represents an important source of stress to the child and that the stress hormones released could potentially damage the child's developing brain. He bases his first argument on studies of infant attachment.

### What is Attachment?

'Attachment theory' with its roots in Psychology, proposes that it is important for a child to maintain close proximity and develop affectional ties with an attachment figure (usually the parent). This theory initially developed by Dr. John Bowlby, was based on earlier animal studies from the 1960's performed by Dr. Harry Frederick Harlow which demonstrated the importance of caregiving and companionship in the early stages of a primate development.

In a series of experiments conducted between 1963 and 1968, Dr. Harlow wanted to know what type of cue from the mother was the most important to comfort a baby monkey in times of threat. In order to assess this, he first separated young monkeys from their mothers, and after a while, he offered the young monkeys a choice between two surrogate "mothers." In the first group, he presented the baby monkeys with a terrycloth mother that provided no food but was made up of a soft fabric to which the baby could climb for comfort. In the second group, he presented the baby monkey with a surrogate mother that was made of wire but that provided milk through a bottle attached to the wire. Then, he brought a stranger into the cage and this frightened the baby monkey who ran toward the mothers. The question was to determine to which type of mother the baby monkeys would run. The results of Dr. Harlow's studies showed that upon exposure to a stressor (stranger in the cage), the majority of baby monkeys ran toward the terrycloth mother that did not provide milk, but did pro-

vide a comforting feeling. Dr. Harlow's interpretation was that the preference for the terrycloth mother demonstrated the importance of affection and emotional nurturance in mother-child relationship.

This set of data was taken up by a British psychoanalyst named Dr. John Bowlby. In his interactions with children and parents, Bowlby observed that separated infants would go to extraordinary lengths (e.g., crying, clinging, frantically searching) to prevent being separated from their parents or to reestablish proximity to a missing parent. While working on this issue, a colleague of Dr. Bowlby's, Dr. Mary Ainsworth observed that there exist important individual differences in how children react to being separated from their parents. In order to determine the attachment style that a child displayed for his/her parent, Dr. Ainsworth developed a technique called the strange situation, which is a laboratory paradigm that is used to study infant-parent attachment.

In this paradigm, 12-month old infants and their parents are brought to the laboratory. For a few moments, the child and parent are allowed to interact, and then a stranger comes in. The parent then leaves the room, leaving the child with the stranger. The parent comes back into the room and the stranger leaves. The parent leaves again, letting the child alone in the room, and then comes back. The behaviour of the child is observed throughout the experiment.

Dr. Ainsworth's studies showed that about 60% of children behave in a 'typical way', i.e. they become upset when the parent leaves the room, but, when the parent returns, the child actively seeks the parent and can be easily comforted by him or her. Children who exhibit this pattern of behavior are deemed to have a secure attachment style.



About 15% of children however become extremely distressed upon separation, and when reunited with their parents, they have a difficult time being soothed. Also, they often exhibit conflicting behaviors that suggest that they want to be comforted, but that they also want to "punish" the parent for leaving. These

children are deemed to have an anxious-resistant attachment style.

Finally, about 25% of children are said to have an avoidant attachment style. Avoidant children do not appear too distressed by the separation, and, upon reunion with the parent, they actively avoid seeking contact with their parent, sometimes turning their attention to play objects on the laboratory floor. Further studies by Dr. Ainsworth assessed the interactions between parent and child in the home environment. These studies showed that securely attached children tend to have parents who are responsive to their needs, while children who appear insecure in the strange situation (i.e., anxious-resistant or avoidant) often have parents who are insensitive to their needs, or inconsistent or rejecting in the care they provide.

Now, back to the first argument advanced by Dr. Chicoine and Mrs. Collard in their book. Recall that they summarize and interpret the data from important studies for the public and state that these studies have shown that placing a child in daycare before the age of 2 can prevent the child from developing a secure attachment to his-her mother. They base their conclusions on the findings of a study conducted by the National Institute of Child Health Development (NICHD) in the United States.

### The Real McCoy

In 1989, the NICHD launched a collaborative research effort by several teams of leading developmental psychologists from around the United States. This Study of Early Child Care followed children over time and was specifically designed to assess the effects of early childcare on child development and attachment. In 1991, the study enrolled 1,364 children and their families at 10 locations across the U.S. Over the years, researchers followed the children and measured their development at frequent intervals from birth through middle childhood. The study took into account many variables, including characteristics of the child care and the family environments, and researchers assessed children's development using multiple methods.

The first results appeared in the scientific literature in 1997. Using the strange situation described above, they examined the association between daycare and infant attachment styles. They found that the experimental groups did not differ from one another in terms of attachment styles. Even infants who had extensive childcare experience (i.e. more than 30 hours per week) did not display more distress when separated from their mothers compared to infants who were not in daycare.

The researchers thought that several factors could influence attachment style e.g. quality of care, age of entry into daycare, stability, or type of care. So they performed a second study and looked at these as well. Scientists found to affect the attachment styles of the children in the study. One variable however did have an impact on child attachment style and it was maternal sensitivity and responsiveness.

Here, results showed that low maternal sensitivity/responsiveness combined with poor quality child care, combined with more than minimal amounts of child care, combined with more than one care arrangement was associated with infants being less likely to develop a secure attachment style. (for a description of the NICHD results, visit the website address : <http://secc.rti.org/abstracts.cfm> you will find summaries of each of the studies and links to the complete research article ).

The Take Home Message here is that unless a mother displays low sensitivity and/or is not responsive to her child's needs, her child will be securely attached even if the quality of the day is questionable or the child enters at a young age.

### McCoy has an Identity crisis

Despite these conclusions, the NICHD study results are used as the necessary "scientific proof" by advocates of the view that daycare at an early age can have a negative impact on child attachment. As you can imagine, the study findings have received considerable attention from the media but unfortunately, the reports have often conveyed the study findings in a negative light. Instead of stating that poor maternal care in combination with early daycare can have a negative impact on child attachment, -the key element here being maternal care- reports have simply stated that daycare at an early age is detrimental to child attachment.

What has helped fuel the media's spin on the study findings were the views held by a small few of the researchers that collaborated on the study. Dr. Jay Belsky, for instance has consistently argued that the NICHD findings do suggest that placing a child in daycare early in life (before the age of 1) for extended periods every day (i.e. 10-12 hours per day) can have a detrimental impact and that parents should be encouraged to not leave their kids in daycare for long hours. Why?

Here is where things get a little tricky. Some children who spent more than 10 hours in daycare per day did develop insecure attachment styles BUT only under 3 specific conditions: 1) when the mother was insensitive in her mothering, 2) when the child was placed in a low quality day care and 3) when there was more than one caregiving arrangement in the first year.



Only under those conditions, did daycare impact on child attachment. Thus, as a group, children who went to daycare for more than 10 hours a day in the first year of life never showed greater insecure attachment, only a small number of the children in the group did and they had to be exposed to the 3 conditions mentioned above.

Many other scientists were not prepared to accept the conclusions of Dr. Belsky as definitive and some researchers in the NICHD study Network have expressed public disagreement with how Dr. Belsky has presented the findings in the media, since these results are subject to multiple interpretations, and the meaning of the findings is more complicated than the media coverage would suggest.

Many of these scientists wrote comments in scientific journals stating that these results could be called into question due to what are known as artifacts (a form of experimental error leading to the misinterpretation of a given dataset). The artifacts to which the doubting scientists referred in the NICHD study was related to the strange situation paradigm used to assess mother-child attachment.

In this paradigm, the mother leaves the child alone in the room and scientists assess how the child reacts. However, children who go to daycare are likely more accustomed to seeing their moms leave the room than are children who stay in the home. So some scientists have argued that children from daycare may act in a more relaxed way to the absence of the mother, and this could then be interpreted as 'avoidant-resistant' in the Strange situation task (Clarke-Stewart, 1989). This would definitely constitute an artifact of the design and as such would argue against the interpretation that early child care experience renders a child insecurely attached to his/her mother.



Second, one set of findings from the NICHD study, rarely ever discussed in the media but that has emerged repeatedly in the scientific literature is that family factors such as parent rearing style (including

mom's and dad's), availability, behavior etc. are typically more predictive of child functioning than are child-care factors. In other words, family matters as much (if not more) to a child's development and well-being than child care.

Thus, overall the data do not seem to support Dr. Belsky's and Dr. Chicoine's view of things. We must state that Dr. Belsky is a well-respected researcher and in all fairness to him, in all of his scientific papers, he makes explicit that the arguments he is advancing are 'inferential', based on 'circumstantial evidence' and that other scholars 'could, would and should' read the data differently and draw different conclusions (Belsky, 1986, 2001). This is all to his credit.

### When McCoy becomes Johnson

Dr. Chicoine on the other hand, presents data from the NICHD study and Dr. Belsky's views in an entirely different light. In his book 'Le bébé et l'eau du bain', he misinterprets or re-interprets the data and the conclusions of the NICHD studies. He provides a new view that is even more rigid than any position adopted by scientists espousing the negative view of young children in daycare. For instance, Dr. Chicoine argues that daycare before the age of 2 can be harmful. No one has ever said as much, not even Dr. Belsky who consistently argues in his scientific papers that day-care before the age of 1 is what is at issue.

Even though the amount of time spent in daycare has been the focus of much of the arguments against early daycare, Dr. Chicoine puts forth that the age of entry is the key factor. No data support this, yet. Dr. Chicoine argues for a particular age of entry, under which children are at risks for all sorts of mental health problems. We feel that unfortunately, the view presented to the public in Dr. Chicoine's book is biased; the book does not present both sides of the dataset (or the relevant side for that matter) and draws interpretations about biological and brain development that are not supported by existing evidence. The public can be very sensitive to arguments supposed to be based on biological and brain development evidence. In this sense, the arguments presented by Dr. Chicoine could be described as dogmatic.

### It's the Stress of it All...OR IS IT?

Why does Dr. Chicoine state that placing a child in daycare before the age of 2 can be detrimental for a child's attachment to his/her mother? He argues that by doing so, one places a child in a very stressful environment and long-term exposure to stress can lead to mental health disorders. In fact, he bases this strong affirmation on studies performed in the 1970's that showed the

negative effects of maternal separation on an offspring's stress hormone levels.

This set of data comes from studies performed by Dr. Seymour Levine and his team. Based on previous studies by Dr. Bolwby and Dr. Harlow on the impact of maternal separation on a child's behavior, Dr. Levine asked whether maternal separation could create a stress response that could eventually be negative for the child's development. In a series of experiments, Dr. Levine measured the levels of stress hormones secreted by baby rats (pups) that were separated from their mothers for various periods of time.

The first finding of Dr. Levine was that after rat pups are born, there is a period in which they do not respond to stressors in their environment. In fact, from day 4 to day 14 after birth, the pups do not release stress hormones in the face of challenge or stress (this hypo-responsive period seems to occur as well in human children and new data suggest that it could expand from month 3 to month 12). This lack of a stress response is thought to be an adaptive process that protects the pups from the potential negative effects of stress on its development. Dr. Levine was curious to see if this stress hypo-responsive period was set in stone. So, he set out to find stressors that could possibly circumvent it.

After multiple studies, he found that only one type of manipulation could trigger a stress response during this hypo-responsive period. Separation from the mother. Dr. Levine showed this by taking the pup out of the mother's nest and placing it alone in an incubator for various periods of time. The results of his studies showed that maternal separation consistently induced a large stress response in the pups, even when the pups were tested during the stress hypo-responsive period. With this set of studies, Dr. Levine showed that maternal separation is a potent stressor for rat pups<sup>1</sup>. Further studies performed in rats by the group of Michael Meaney in the 1980's showed that young rats who have been separated from their mothers for longer periods of time present increased reactivity to stress in later life that is associated with cognitive impairments.

Based on these animal studies, Dr. Chicoine states that the fact of placing a young child in daycare creates the same situation of maternal separation as that observed in rat pups and thus, could potentially induce the same negative consequences on a child's brain development as those shown in rodents by the team of Dr. Levine and Dr. Meaney.

Unfortunately, the scientific data reported by Dr. Chicoine have not been correctly interpreted by him.

In the last section of this paper, we report on four main conclusions drawn by the author that are incorrect when one assesses the scientific literature on this important topic.

The first argument put forward by Dr. Chicoine is that a child will react with a very important production of the harmful stress hormone cortisol to the daycare environment when placed before the age of 2. First, it has to be stated here that the stress hormone cortisol is not always harmful; we need this hormone to survive! Cortisol only becomes harmful when it has been produced for very long periods of time, and in response to highly stressful and/or traumatic events. Second, and as reported in the excellent article of Marie-Claude Geoffroy in this issue of the Mammoth-Magazine, cortisol levels are not systematically elevated in daycare. Studies have not reported that daycare utilization at any age leads to increased production of stress hormones. Here again, what science tells us is much more subtle than what Dr. Chicoine states and so, it definitely needs to be qualified.

Science tells us that vulnerable children (i.e. those with a particular temperament) will produce high levels of the stress hormone cortisol when placed in low quality daycare with caregivers who are insensitive to their needs. Note that here again we need more than one factor in the mix. This is a very different message than the one sent to parents by Dr. Chicoine.

Instead of telling them that they are harming their child by placing them in daycare, one should tell them that when they decide to place their child in a daycare, they should be very careful in choosing a daycare with high quality environment, a sensitive caregiver etc. So, if one really wants to help parents, one should give them a list of factors to consider in choosing a good daycare, instead of telling them that they will harm their child in placing him/her in daycare. In the last article of this issue of the Mammoth-Magazine, Marie-Claude Geoffroy lists a set of factors that can be taken into consideration by parents when choosing a daycare for their children. These factors are used in scientific studies to evaluate the impact of daycare on child development and can serve as guidelines for parents in choosing a good daycare for their children.

The second argument put by Dr. Chicoine is based on the studies of Dr. Levine who showed that when a pup is separated from its mother, it produces a very large stress response that can be harmful in the long run. Dr. Chicoine extensively uses this dataset in order to make the point that placing children in daycare

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<sup>1</sup> This laboratory manipulation is not akin to placing a child in an incubator at birth due to complications. The concerned parent need not worry; the circumstances surrounding this practice in humans are VERY different from the conditions in a laboratory with rats.

before the age of 2 can lead to a large stress response which could have negative impact on mental health in later life. However, a very important distinction between the animal and human data has not been made by Dr. Chicoine.

In animal studies, when the pup is separated from its mother, it is placed alone in a small cup in an incubator (a colleague of mine calls them ‘pup-in-a-cup’). So in studies of maternal separation in pups, the animal is alone for the entire period of separation. However, in humans, the child is never left alone in a house when separated from his/her working parents. The child is cared for by specialized educators and is surrounded by other children his/her age. Consequently, there is a large difference between the animal studies on maternal separation, and the human paradigm of separating a child from a working parent.

The third argument put forward by Dr. Chicoine in order to state that daycare can be detrimental for brain development and attachment is that there exists a biological basis to the theory of attachment, i.e., scientists have found that certain regions of the brain underlie a child’s attachment to his/her parents. However, in contrast to what Dr. Chicoine advances, there exist no data in the scientific literature that show that different brain regions totally and independently subserve child attachment.

The last of Dr. Chicoine’s arguments that we wish to discuss here is that he feels that daycare alone is THE culprit, and that sending our children to daycare renders them insecurely attached because of increased stress levels. He makes no mention of the importance of the quality of care. The only way to see if quality of care affects stress hormone levels is to perform a true experimental study in which one manipulates quality of care.

One group of researchers did precisely this in 9 month old babies (Gunnar et al., 1982). Following separation from their mothers, children were randomly assigned to one of two quality conditions, high or low. In the low-quality condition, the caregiver was instructed to be busy while the child played with toys. In

the high-quality condition, the caregiver settled the child with toys and continued interacting and playing with him/her. Significant increases in cortisol were observed in children with low-quality conditions, but not in those with high-quality conditions. These results show that quality of daycare is one of the most important factors to take into consideration where stress hormones are concerned and not daycare alone.

## Conclusion

Dr. Chicoine bases his arguments on his interpretation of the NICHD study findings and what he feels are the appropriate studies to quote in the stress literature and he is indeed entitled to his view. With all due respect to Dr. Chicoine, we do not share his view. It is our contention that one cannot take a set of findings that applies to a very small portion of a study’s participants only under very specific circumstances at that and generalize them to the entire population.

As you have seen in this lengthy analysis, nothing is clear cut. It rarely ever is in science. Things often need to be qualified by statements like this is true only when A, B, and C are present. Scientific studies are also very complex and are not always easily explained in every day language but we would do a disservice to the public by continuing to underestimate their ability to understand the complexity of certain issues and to put things into the appropriate context. That being said however, we became specialists in specific areas because we wanted a more in depth understanding of them than the next guy. People look to the experts for their answers. It is of critical importance therefore that these answers be clearly, honestly, and responsibly given.

Given the choice, any parent would opt for higher quality daycare. Given the choice, any parent would opt for leaving their child in daycare for fewer hours per day. This is common sense. So, for those who do have the choice and for those who simply don’t, our advice to you is to continue to do what you do best. Love your child, talk to your child, listen to your child, play with your child, and enjoy the time you have together. ❌



## DAYCARE : QUALITY IS THE CUE TO PREVENT STRESS IN OUR CHILDREN CUES TO LOOK FOR WHEN CHOOSING A DAYCARE

By Marie-Claude Geoffroy, Ph.D. Candidate, University of Montreal (Translation : Shireen Sindi; Edition: Tania Schramek)

“Where is mommy?” asks 2 year old Léa, her voice filled with emotions. Her mother, just like 51 000 other mothers of children under the age of 2 in Québec, made her way to work this morning after having dropped off her daughter at daycare. Léa’s mother is worried. She heard on television that attending daycare at a young age is a source of stress that is potentially dangerous for children’s health.

Do we really stress our children by sending them to daycare as certain doctors have asserted? Should we really say goodbye to our boss and become stay-at-home moms? And what if this simply isn’t an option? What’s the answer for mothers who are obliged to work full time to make ends meet?

According to recent scientific studies, there is evidence that allows us to doubt the thesis that states that sending one’s child to daycare is stressful.

### Stress in children at daycare under scientists’ microscope.

When we are stressed, our bodies secrete the stress hormone cortisol. Scientists have taken advantage of the fact that cortisol levels can be detected in saliva and have measured the levels of cortisol in children at home and compared them to cortisol levels obtained in daycare.

So, can daycare be stressful? The answer is yes, BUT this answer needs to be qualified. The results of a meta-analysis recently published in the Canadian Journal of Psychiatry -the most important journal in psychiatry in Canada- by specialists based at the Université de Montreal (Marie-Claude Geoffroy PhD candidate, Dr’s Sylvana Côté and Sophie Parent of the department of Psychoeducation, and Dr. Jean Séguin of the department of Psychiatry), show that the quality of the day-

care setting a child attends and the child him/herself are important factors in the equation.

The conclusions drawn from this meta-analysis are robust because a meta-analysis is a process that permits us to combine results from many comparable studies, and then re-analyze them with the help of scientific tools.

### **It depends on the quality**

Scientific studies show that children who attend a daycare of high quality, where the caregiver is sensitive, affectionate and attentive, are not more stressed than when they stay at home. A caregiver who is sensitive and attentive would be in a position to know and to respond to the specific needs of children, and therefore would increase their sense of control and decrease their stress levels.

It is not always easy for parents to know if their child's daycare is of high quality or not. There are however, some good indicators of the quality of a daycare service: the caregiver creates a warm and supportive environment; he/she takes the time to smile, to touch, to talk to, and to hold the children in her arms; the caregiver encourages the children to become active and get involved in a variety of activities. None of these indicators though can replace a parent's first impression when he/she visits the daycare. The parent should be looking for a caregiver who smiles and presents the environment in which the children develop and play and who clearly describes the events of a typical day. One must also choose a daycare service where the personnel are stable, as this may be de-stabilizing for a child, if he/she has to constantly adapt to new people.

### **It depends on the child**

Here again, stress is relative. What may appear to be stressful for some children is not necessarily stressful for others. In daycare settings, timid children who are withdrawn are the most susceptible to secreting larger amounts of stress hormones. Caregivers should pay extra and special attention to these children in order to facilitate their integration at the daycare. Contrary to popular belief, very young children are not at the greatest risk of experiencing stress at daycare. The risk is greater for children aged between 3 and 5 years old. Why? Group play begins at this stage but their communication skills do not always allow them to adequately express their needs. This is where having a sensitive caregiver can help to reduce the stress experienced by children, teaching them alternative methods that allow children to better manage conflicts.

### **Stress at the daycare: Is it harmful for children's health?**

Research to date into the effects of daycare on stress levels in children does not allow us to draw any definitive conclusions with regards to the consequences of an increase in stress hormones on children's health. It has been shown that an intense level of stress, such as that associated with abuse, neglect, war-related trauma, or extreme poverty, may be associated with negative effects on one's health. However, these types of stress are very different than that experienced on a daily basis by children who attend daycare.

### **What conclusions can we draw from the current state of research ?**

The real question does not lie on the advantages and the disadvantages of sending one's child to daycare, but rather on the quality of care that they are receiving. This is particularly true for children who are isolated, withdrawn into themselves, and have difficulties integrating in groups. A sensitive, attentive, and affectionate caregiver would be in a position to help children better adapt and therefore decrease their stress levels. These are the conclusions that we can draw from the current state of research. Nevertheless, the research field is still young, and there remain many questions for which answers will come, thanks to upcoming research.

### **Choosing a good daycare for a child**

Choosing the right daycare is a source of worry for many parents. The current state of our daycare system and its long waiting lists make it pretty hard to refuse a spot that becomes available just when we were planning to go back to work. Given that the quality of the daycare setting plays an important role in a child's well-being, parents must demand a high level of care.

### **But what is a high level of care? How do you recognize a good daycare?**

Scientists agree that a good quality daycare is one that offers highly tailored care that meets the relational and educational needs of children. Thus, in a good daycare, the caregiver is; loving, affectionate, empathetic, and he/she takes the time to smile at and praise the child; the caregiver is also sensitive and in tune with what makes each child unique. In the daycare, one can find a wide variety of educational tools that foster optimal development and the number of children per caregiver does not exceed accepted norms. For children below the age of 18 months, the caregiver-child ratio is 1/6, 18 months and up 1/8 children per caregiver and for children of 4 and up the ratio is 1/10.

Scientific studies use two evaluative tools to determine the quality of a daycare setting. These tools however can be equally helpful for parents. They are: the Pre-school Environment Evaluation scale (2½ to 5 years) and the Environmental Evaluation Scale for Infants and Toddlers (0 to 2 ½).

It is important to note that these criteria are offered as a simple guide and that parents should adapt the

criteria to the age of their child. Alternatively, parents are also encouraged to visit the daycare setting and observed their child; “does he/she have friends? Does my child feel safe? Is the caregiver attentive to my child”? Given that each child is unique, much like each experience is unique; none of the criteria below can replace the good judgment or intuition of a parent.

### **Furniture and Layout**

- ✓ The size of the play material is adapted to children (e.g. small tables, play kitchen);
- ✓ There are many things of interest to children at eye-level (e.g. near meal areas, near beds, near the play area);
- ✓ The arrangement of the room stimulates autonomy in children
- ✓ The caregiver organizes periods of physical activity and/or new challenges are added every week (e.g. obstacle courses, tunnels, balancing games, summersaults on gym mats, ball games);
- ✓ The outdoor space is made up of different surfaces allowing for different types of games (e.g. sand, concrete, grass) and is protected from the elements (e.g. provides shade in the summer, blocks wind, allows for sun exposure in the winter)

### **Personal Care**

- ✓ Arrival and departures are well-planned and warm regardless of the time of day, (e.g. conversation upon arrival and art work and are ready for the end of the day);
- ✓ Children are active right up until departure (e.g. there are not long periods of inactivity and the caregiver allows the child to finish their games in a pleasant way);
- ✓ The caregiver makes arrivals and departures fun for the child (e.g. when the child comes in he/she leads him/her to his/her favorite toy, when the child leaves the caregiver describes activities to come the next day)
- ✓ At meal and snack time, children are encouraged to develop autonomy (e.g. children under 2 are encouraged to eat with their hands and with a fork once they are able, older children are encouraged to participate in meal preparation, set the table, pour liquids when they are able);
- ✓ Meal and snack time are moments of conversation such that the caregiver encourages children to talk about the events of the day or things they find interesting
- ✓ Parents are made aware of the menu
- ✓ During nap time, the needs of each child are respected (e.g. children who do not sleep can play quietly, and nap schedules are consistent with developmentally appropriate norms);
- ✓ Personal care is integrated into learning activities to stimulate development and stimulate autonomy (e.g. song for tooth brushing, hair brushing exercise);
- ✓ Children respect security guidelines (e.g. they do not climb on bookshelves and are not too many on a slide).

### **Language and Reasoning**

- ✓ A wide variety of book are available and rotated to maintain interest;
- ✓ The caregiver talks to children below the age of two throughout daily activities (e.g. she repeats what a child says adding words and ideas when needed);
- ✓ Children over the age of 2 are encouraged to talk to solve problems and questions such as “why”, “how”, and “what is going on” are asked;
- ✓ The caregiver works the whole day at improving language skills (e.g. gives clear directive, uses good language, organizes and presents at least one language-related activity for each child, everyday and encourages children to name objects);

✓

### **Learning Activities**

- ✓ The caregiver helps children to develop their abilities;
- ✓ The material is placed in a manner that stimulates autonomy (e.g. image-based labels to identify shelves and storage boxes)
- ✓ Among the activities offered, one finds arts and crafts, building blocks, water and sand games, role-playing games, building games, mathematics, musique and movement;
- ✓ If used, a television serves for educational purposes only;
- ✓ The caregiver watches the shows at the same time and he/she comments and asks questions;
- ✓ Activities that aim to expose children to the understanding of differences (e.g. parents are invited to share their customs, and many cultures are represented at holidays and birthdays);

### **Interactions**

- ✓ The caregiver points out kindness and collaboration in the children;
- ✓ The caregiver seems happy in the presence of the children;
- ✓ The caregiver asks children about their game ideas;
- ✓ Balance is maintained regarding the need for children to learn on their own with caregiver interventions aimed at educating (e.g. the caregiver lets children finish their painting before he/she asks them to describe it or the caregiver lets the child learn that his/her blocks have fallen because they were not well balanced);
- ✓ The caregiver helps children to develop their social skills (e.g. they learn to wait their turn at a popular game, material is provided that promotes cooperative play like a double swing or a walkie-talkie set);
- ✓ The caregiver intervenes quickly before conflicts escalate (e.g. he/she helps children share toys and orients children towards other activities);
- ✓ The caregiver also involves children in finding a solution to their conflicts (e.g. he/she helps the children talk through a solution and he/she makes children aware of the emotions of others);

### **Structure of Service**

- ✓ Easy transitions are made between daily activities (e.g. the material for the next activity before the first one finishes; the transition from one activity to the next is done a few children at a time and not the whole group at once);
- ✓ Well organized activities avoid conflict (e.g. there are many same toys for younger children and there is sufficient material for several children to be engaged in the same activity);
- ✓ The schedule is modified according to the needs of individuals (e.g. shorter story-time for children with a short attention span; children can finish their activity beyond the originally planned; a child who eats slowly can eat at his/her rhythm);
- ✓ The caregiver takes advantage of individual activities to spend some one-on-one time with each child;
- ✓ The caregiver uses a quiet area to avoid fights or to promote a child's concentration

### **Parents**

- ✓ The caregiver asks parents to evaluate the daycare every year through questionnaires or group meetings;
- ✓ The caregiver provides the parent with an informal report of their child's activities on a daily basis;
- ✓ The caregiver attends conferences, training sessions, or seminars;

Reassured, Léa's mom, just like the 51 000 other mothers in Québec, went to work this morning and said to her child "See you tonight my little angel and have a

very nice day" as she closed the door of the daycare behind her. ❌



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**Mammoth-Magazine**

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