

**Actes du 17<sup>e</sup> Congrès de l'Association internationale d'ergonomie,  
Beijing (Chine) 9 au 14 août 2009**

**Identifying competencies that support 911 emergency  
call centre agents and reduce psychosocial risks**

Toulouse G.<sup>1</sup>, St-Arnaud L.<sup>2</sup>, Lévesque J.<sup>1</sup>, Duhalde D.<sup>3</sup>,  
Paillé A.<sup>2</sup>, Delisle A.<sup>4</sup>, Comtois A-S.<sup>3</sup>

<sup>1</sup>Institut de recherche Robert-Sauvé en santé et sécurité  
Montréal, Québec, Canada, [Toulouse.georges@irsst.qc.ca](mailto:Toulouse.georges@irsst.qc.ca)

<sup>2</sup>Université Laval, Québec, Canada

<sup>3</sup>Université du Québec à Montréal, Canada

<sup>4</sup>Université de Sherbrooke, Québec, Canada

This paper presents one of the orientations of a study carried out to reduce the prevalence of musculoskeletal and psychological health disorders in call centre agents in Québec 911 emergency telecommunication centres (911-ETC). The study evolved by taking into account the context of the development and quality control of call centre agents' work. From this perspective, the concept of competency appears as a central aspect in orienting the improvement of quality and of health and safety. The use of the concept of competency in ergonomics, the methodology and the main results will be presented.

## **INTRODUCTION**

This paper presents one of the orientations of a study carried out to reduce the prevalence of musculoskeletal and psychological health disorders in call centre agents in Québec 911 emergency telecommunication centres (911-ETC) (Toulouse et al., 2006). The study was developed by taking into account the context in which 911-ETCs developed, so as to be consistent with the perspectives of changing this work. In fact, over the last few years, this change has begun to be structured and organized at the provincial level. 911-ETCs came into existence some twenty years ago, when the telephone company relinquished to municipal public security the responsibility for taking emergency calls. All of North America adopted an emergency telephone number, 911, shared by the police, fire department and ambulance service. The work in 911-ETCs therefore involves different call taking and dispatching tasks whose number and distribution between call centre agents varies with the size of the centres. The tasks are the following: taking 911 calls; answering calls to public security; police and fire department dispatching; tasks related to the police information centre (CRPQ, centre de renseignements policiers); answering calls for public works; reception at police stations; tasks related to surveillance programs; or other administrative tasks. The qualifications for this position are the following: having a high school diploma, the ability to communicate in French and in English, receiving security clearance, and successfully fulfilling the qualification of the CRPQ. In some centres, one year of experience in a call centre is required. Each centre trains its call centre agents when they are hired. Most of the positions occupied by civilian personnel are held by women.

This profession in Québec has only recently begun to be organized. The Association of emergency call centres was created in 2000. This association participated in the development of a new law guiding the activities of 911-ETCs whose application over the next few years aims to improve the quality of services. This process can have a positive impact on risk reduction, insofar as the quality procedures are based on knowledge of the actual work requirements and reconcile the constraints of the different departments and actors involved in emergencies. From this perspective, the objective of this paper is to describe the requirements as well as competencies applied by 911-ETC agents, as well as to identify the conditions that promote or hinder the retention and development of these competencies.

## **THE STUDY OF ERGONOMIC COMPETENCIES**

The concept of competency in ergonomics lies in the description and elucidation of the mental activities applied in the work for the purpose of improving working conditions. Competency is not considered for the purpose of evaluating the call centre agent's activity, but as de Montmollin (1984) mentions "... to explain, and not describe, the operators' behaviours, which are not produced randomly and unexpectedly, but indicate clearly what everyone knows...". (free translation) The definition of this concept is directly linked to the reference model describing the relationship between the worker and the workplace variables. De Montmollin (1984) directly associates the concept of competency with the concept of task as a problem that the worker must solve. He defines competencies as "stabilized sets of knowledge and know-how, standard conduct, standard

procedures, types of reasoning that can be applied without new training.” (free translation) In the same vein, for Leplat (1991) competency is “the knowledge system that allows the activity to be produced that meets the task requirements of a certain class.” (free translation) Other authors define the concept of competency not in relation to the worker-task relationship but in relation to the worker-situation relationship (Rogalki, 2001; Mazeau, 1995) and extend it from the individual to the group, or to the collective (Mazeau, 1995). The concept of situation, while not clearly defined, refers to on-site observations, and seems to us therefore to introduce two ambiguities associated with the concept of task. The first involves the definition of the concept of task in ergonomics, which, while most often referring to the prescribed task, can also refer to the concept of actual or effective task. The second comes from the fact that the concept of actual task covers both the construction of the task by the operator and the characteristics of the actual operating conditions that he has to deal with. From this perspective, the concept of situation will be defined as a construction originating from the interaction between the operator faced with the actual operating conditions and the prescribed task. The actual operating conditions correspond in the case of 911-ETC agents to requests by citizens and first responders as well as to the technological, organizational and environmental conditions as they present themselves throughout the work period. The prescribed task combines all of the objectives, rules, procedures, guidelines and organization planned for carrying out the work. The work situation is therefore the result of the action of the worker who interacts, in relation to his physical, cognitive, psychic and collective resources, with the actual operating conditions and task requirements.

The description and characterization of these work situations are the basis for the description of the competencies used by call centre agents. This model is consistent with that of Bruner (1990) who associates the concept of competency “with the significant situation” constructed by the subject. According to this model, the description of competencies is not simply identifying how to solve a problem, which would be outside the worker, but describing how the worker constructs the problem in order to solve it. The problem is represented not only by the actual operating conditions, but also by the articulation of these actual operating conditions with the task specifications. Problems are constructed and solved beginning with the worker’s internal and external resources. Internal resources are of a cognitive and psychic nature (strategies based on the application of know-how, ability, finding information, etc.). External resources are related to how the information is organized at the workstation in order to make it accessible as rapidly as possible, and to the mutual assistance between call centre agents.

The mobilization of resources for 911-ETC agents falls within the context of client relations work. Studies in this field have identified some specific characteristics to be considered: the unpredictable nature of the frequency of requests for service and their cognitive and emotional content (Pochat et al., 2000), the cognitive activity in the construction of the request in relation to the services provided (Duhamel, 2000; Pochat et al., 2000; Roux, 1993), the emotional work (Hochschild, 1983),

and the emotional susceptibilities of people who are faced with some types of conflicting or tragic events (Mercier-Leblond, 1994).

## METHODS

### Public security call centres

The study was carried out in five municipal public security call centres in Québec. The centres were chosen with the help of the Association paritaire pour la santé et sécurité du travail secteur “affaires municipales” du Québec (APSAM, joint health and safety association, municipal affairs sector). They differ in size and cover rural and urban regions of Québec, but not remote regions. A follow-up committee was created, bringing together managers and representatives of the workers in each of the centres.

### The population studied

Fifteen call centre agents participated in the study (four call centre agents were followed in two centres, three in one centre, and two in two centres). The call centre agents were chosen among volunteers, with the help of management and union representatives from each of the centres. The participants were 9 women and 6 men, with an average age of 37.7 years, and whose experience averaged 13 years. The most experienced had 23 years of experience, and the least experienced had been on the job for 4 months. Seven of the call centre agents had high school diplomas, six had college diplomas, and two were university graduates.

### Data collection and analysis

The data for each call centre agent were collected over a complete work shift. The call centre agents were filmed and their communications recorded. They had to complete a subjective evaluation scale based on Borg’s CRD-10 approximately every thirty minutes. The aspects evaluated were musculoskeletal pain, workload, complexity, negative and positive emotions, controlling emotions, and fatigue. The following day, a self-confrontation interview was conducted, based on the data collected during the work shift in relation to the characteristics of the communication situations (application of procedures, difficulties encountered, type of response to the caller) and to the evaluations obtained from the subjective scales.

The interviews were conducted with the managers of the centres, and available documents on the prescribed tasks were collected. A few training documents relating to the call centre agents’ communications with police officers were not accessible.

The initial analysis involved documenting the communications according to the type of telephone line (991, public security, internal), the emergency request, or the request for public security services, the chronology of the dialogue, the characteristics of the communications, and the types of questions and answers given by the call centre agents. Groups were then formed to characterize the work situations

according to the type of problem encountered in relation to the caller's request, and the types of answers in relation to the transfer of calls. The call centre agents' comments obtained during verbal descriptions of the situations were integrated in order to document how call centre agents help construct the request and respond to the caller. The descriptions were used to illustrate the operators' competencies in relation to the subjects dealt with, the individual or group strategies, as well as the conditions relating to task specifications that could facilitate or hinder the development of competencies. Subsequently, the results were presented and validated with the follow-up committee.

## RESULTS

The results presented involve several situations characteristic of the call centre agents' work activity. They illustrate the application of the analytical model developed.

### **Requests varying according to how they are expressed and their content**

Callers to the public security call centre contact the call centre agents on a wide variety of subjects (road safety, accidents, reporting a suspicious or hazardous event, neighbourhood conflicts, family conflicts, harassment, aggression, suicide, disappearance, gas leak, electrical hazard, fire, information on police or legal procedures, medical, psychological or psychiatric assistance, animal problems). The analysis of the communications of the call centre agents participating in the study shows that the caller clearly defines the content and how the requests are expressed in approximately 85% of the calls (the percentage may vary, depending on the work shift). The call centre agent is also able to obtain the necessary information for sending help (address, description of the emergency situation: severity, people involved, material conditions). These requests are responded to through the application of standardized procedures based on the prescribed guidelines. These guidelines are defined in each centre on the basis of agreements with the first responder services: police, ambulance, firefighters and public works.

The remaining fifteen percent of calls required a more dynamic communicational activity by the call centre agent. This activity ranged from the exact identification of the address to a greater involvement in developing the request and the response. Due to the variety of subjects, the call centre agent must have a large amount of knowledge in order to be able to question the caller, and to evaluate and define the caller's request, so that he can transfer it to the relevant department. For this, the perceived workload is not solely linked to the frequency of incoming calls, but also to the difficulties in defining the request and in assigning it a priority. Some call centre agents therefore prefer to be assigned to police dispatching because, even though there is a higher frequency of tasks, these tasks are generally simpler because they are somewhat more standardized. Some emergency or public security calls, on the contrary, are much more demanding from the cognitive and emotional standpoints. In

fact, not only are call centre agents likely to have to deal with a tragic situation that can affect them, but more frequently, the difficulty of the work comes from problems relating to the callers' requests and in articulating the request in relation to the actual operating conditions in public security and the prescribed guidelines. We will examine the main situations encountered pertaining to this subject.

### **The address of the event is not easily identifiable**

The addresses of callers calling from their homes or from a public telephone are automatically displayed; this generally allows the call centre agent to immediately determine where to send the first responders after validating the information. This is not the case when callers use a cell phone or the event that they are reporting is in a location other than their homes. Also, during these calls, the caller cannot always give the exact address. To deal with this problem, call centre agents must have a topographical representation of the municipality or the sector that they are responsible for. They are helped by mapping software of their region. The analysis of the communications shows that call centre agents develop questioning strategies that help the callers determine their location. These strategies are developed according to the type of emergency and the caller's characteristics. For example: the call centre agent asks the caller about specific topographical identifiers (presence of commercial or public buildings, etc.) and then makes his questions more specific in order to identify the exact location. He places himself virtually at the caller's location to guide him in his answers. In most cases, these strategies lead to a successful conclusion. However, sometimes they do not precisely identify the exact location of the event. In these cases, depending on the emergency, the problem is transferred to the first responders, who will attempt to find the location. In some tragic situations, this has a lasting emotional impact on the call centre agent who is unable to forget the situation. Due to a lack of debriefing in such cases, the call centre agent may be left alone to deal with his doubts about his questions that did not rapidly identify the location.

### **The caller does not state the type of emergency rapidly and clearly**

The communication activity mainly involved in 911 calls focuses on a rapid identification of the emergency. The aim of the call centre agent's communication strategies is therefore to have the caller rapidly state the emergency. For this, the call centre agent interrupts the caller, and two types of questions can be asked. One is open, with the call centre agent repeating more vigorously the question asked when answering the call. "What is your emergency?" The other is closed, with the call centre agent asking the caller whether he needs the police, ambulance or fire department. These two questioning strategies correspond to two professional styles. One is more directive, forcing the caller to situate himself in relation to the call centre agent's question, and the other is not directive, forcing the caller to express his request without the call centre agent suggesting it. These two styles are present to a greater or lesser extent in the communications, depending on the type of emergency, the call centre agent, and the emergency centre.

They also correspond to two roles that the call centre agents have to fill. The first, the most recognized, relates to the emergency work and the need for rapid action in sending the first responders. The second, which we will discuss below, relates to the work complementary to the operation of the public security service. A non-directive communication style seems better adapted to this complementary work.

Also, call centre agents must be familiar with different levels of language, particularly of people from the lower income scale. This means that the agent has to remain up to date on the local vocabulary and modes of expression. Call centre agents help each other when one of them is having difficulty understanding the caller's language. For callers speaking in a foreign language, call centre agents have a list of people to contact, but these individuals are generally not on the premises.

### **Callers' requests that go beyond call transfer**

Responding to certain emergencies and providing public security telephone service put call centre agents in situations that go beyond transferring the call. Three categories of situations were identified.

First, as initial responder in emergency services, the call centre agent becomes very involved in situations that he cannot easily get out of to transfer the call to a second call taker. Three types of situations were reported in the present study: the case in which the caller threatened suicide, the case in which the caller was caught in a criminal event, or the case of an emergency whose rapidity of response was vital. The bond of trust that develops rapidly between the caller and the first responder forces the latter to maintain contact throughout the response process. Also, the rapidity of response required by the situation may force the call centre agent answering the call to take charge of dispatching the call himself. In this case, the call centre agent may have the necessary training because he regularly works in dispatching positions, but the same is not completely true for the first two cases. Training in how to respond to these problems is not systematic.

Second, several issues may arise, depending on the actual operation of the public security department, that make the call centre agent go beyond these call answering and dispatching tasks to become a more direct support in the police response. These situations mainly involve searches in police department data banks, technical support for police officers about the procedures to follow in specific cases, the availability of the sergeant and patrol officers, and the handling of a call transferred to police officers but that is not always effective. For example, to avoid overloading police units with certain problems, call centre agents will suggest to the caller or make him aware that approaches other than the police response would be more effective. To handle these communications, the call centre agent has to manage the relationship with the caller. Depending on the call centre agent and the frequency of calls, this management takes either the form of a non-directive style of communication that promotes the caller's expression and reflection but that is not always compatible with his role in emergency call handling, or the

form of a more directive style that confronts the caller even more. This confrontation becomes more delicate if the caller is more aggressive, with the call centre agent following the guideline of always being courteous with callers.

Third, when the caller's request does not correspond to the public security field, the call centre agent cannot always leave the caller in an impasse, particularly when elderly people or people in difficulty are involved. This is particularly true when these individuals are likely to call several times if they do not get an answer. Also, depending on the frequency of the calls, the call centre agent can take a little time to discuss the problem with the individual, to advise him about an approach to take, and to make sure that the caller understands the procedure and is capable of carrying it out.

### **Several operations conducted simultaneously**

Several operations are carried out simultaneously in response to an emergency or during the handling of the telephone call and the radio communications with the patrol officers.

In responding to emergency situations, the call centre agent can communicate with the caller while sending information in writing to the portable computers in the patrol cars, and communicate with the patrol officers and fire fighters by radio. Information is also transmitted in writing between the call taker and the dispatcher. However, a written message cannot completely replace an oral message. Some events are more complex and take more time to express in writing than orally. Also, oral feedback is faster. A written message requires that the call centre agent identify more precisely the information needed by the first responder. Moreover, a written message does not always clearly convey the emergency nature of the information, as does a voice message through a change in tone and flow. This ability to perform several communication tasks simultaneously is acquired with practice and with the development of competency in the use of technological interfaces and in sharing attention between different tasks.

Call centre agents doing call answering and performing dispatching tasks also have to handle the simultaneous arrival of telephone and radio calls. To make this management easier, the prescribed task requires that call centre agents work in pairs. This means that call centre agents must stay informed about the events in progress that their colleagues are dealing with. This is done through computerized calling cards that contain information on the chronology of the events. The work colleague sometimes completes this information orally. Despite this arrangement, problems can arise in the interactions with patrol officers, mainly due to the lack of knowledge that both could have about their working conditions. To reduce the resulting tensions, some centres organize activities between the two departments (call taking and the police department), but in other centres, the departments are becoming increasingly separate.

### **Call centre agents' difficult situations**

During their work, call centre agents have difficulties that

involve a rather high affective load. These difficulties relate to exposure to tragic events but also to various problems communicating with citizens or more rarely with patrol officers. Call centre agents develop strategies to limit the likelihood of conflict. For example, when they have to inform a citizen about a procedure that could conflict with the citizen's request, they explain in even greater detail where it comes from and the process, revealing its positive potential impacts. Also, the call centre agent can pass the call on to his colleague.

Regarding the prescribed task, the team leader is the person who pays attention to and supports call centre agents having difficulties. He also has to work with the sergeant to solve telecommunication problems between the call centre agents and patrol officers. Call centre agents involved in responses to emergencies are not always invited to the debriefing session organized with the police officers for events with profound emotional impacts. Debriefing sessions are generally not planned between them. In some centres, the call centre agents say that they pay attention to their colleagues' emotional reactions. However, their supporting actions are limited. These take place outside of working hours, depending on the social climate and the availabilities of each individual.

### Call centre agents' training situations

Call centre agents are for the most part trained on the job. New recruits first receive theoretical training with the possibility of case simulation, depending on the centre. They are then exposed to real situations, first passively and then more actively, by being paired with an experienced call centre agent. After approximately one month, they are assigned alone to a workstation while being supervised and helped by more experienced call centre agents. Depending on the call centre agent, a two-year period is necessary to completely take control of his work. Early in their careers, new call centre agents must be helped by their colleagues. Hiring periods do not always take this aspect into account. Also, when the apprenticeship period coincides with the busiest season, the workload involved in supervising a new employee can be felt as very high.

### CONCLUSION

This study identifies the work situations that characterize the answering, handling and dispatching of emergency and public security calls. The description of these situations also shows how call centre agents formulate the problems and the strategies that they use to find a solution relating to the prescribed task. The communications show that a majority of the calls correspond to the usual requests of citizens or first responders. These calls are handled by applying standardized procedures. However, for some public security calls and operating constraints, the handling of the requests seems to require specific competencies more or less recognized in relation to the prescribed task. This recognition that is present to a greater or lesser extent affects the support needed to maintain and develop the competencies that would make call centre agents' work easier. It therefore seems that means should be implemented to maintain and develop competencies

at several levels: new employee training and follow-up, call centre agents sharing their experience in this type of work (Cerf et al. 2005), the development of cues for managing the operating constraints of the public security department, and the construction of a common knowledge base between call centre agents and police patrol officers.

### References

- Duhamel, C., 2000, Plates-formes téléphoniques. Des salariés au bout du fil... et du rouleau, *Santé Et Travail*, 31, 10-12.
- Cerf, M., Falzon, P. 2005, *Situations de service travailler dans l'interaction*, Paris, PUF.
- Hochschild, A.R., 1983, *The managed heart, commercialization of human feeling*, University of California Press.
- Leplat, J., (1991), Compétence et ergonomie, in Amalberti, R., Montmollin, M.(de), Theureau, J., (1991) *Modèles en analyse du travail*, Margada, Liège, pp. 263-278.
- Mazeau, M., (1995), Acquisition, maintien et développement des compétences, *Performances Humaines et Techniques*, no 75-76, pp. 73-75.
- Mercier-Leblond, 1994, Le stress chez les intervenants et les intervenantes des mesures d'urgence. MSSS Gouvernement du Québec.
- Montmollin, M.(de) , (1984), *L'intelligence de la tâche*, Peter-Lang, Berne.
- Pochat, A., Falzon, P., 2000, Quand faire, c'est dire, ou la reconnaissance du travail verbal dans l'activité d'accueil, *Compte rendu du 35<sup>e</sup> Congrès de la Société d'ergonomie de langue française (SELF)*, Toulouse, 293-3003.
- Rogalski, J., (1997), Simulation dans la formation à la gestion d'environnement dynamique : approche de didactique professionnelle, in Baron, M., Mendelsohn, P., Nicaud, J.-F., (1997), *Environnements interactifs d'apprentissage avec ordinateur*, Hermes, Paris, pp. 24-36.
- Roux, F., 1993, Enquête ergonomique sur un poste de standardiste, *Cahiers De Médecine Interprofessionnelle*, 33, 339-348.
- Toulouse, G., St-Arnaud, L., Bourbonnais, R., Damasse, J., Chicoine, D., 2006, *Étude de la prévalence des troubles musculo-squelettiques et psychologiques, des facteurs de risques physiques et psychosociaux chez les préposés des centres d'urgence 9-1-1*, Études et recherche, Rapport R-472, Institut de recherche Robert-Sauvé en santé et sécurité du travail, Montréal, 75p.