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Christine Vidal-Gomel* & Catherine Delgoulet**

*corresponding author
Centre de recherche en éducation de Nantes (CREN)
Université de Nantes (University of Nantes)
Chemin de la Censive du Tertre
BP 81227
44312 Nantes Cedex 3
France
christine.vidal-gomel@université-nantes.fr

**Centre de recherche sur le travail et le développement (CRTD)
Conservatoire national des arts et métiers (CNAM) (National Conservatory of Arts and Crafts)
2, rue Conté
75003 Paris
France
catherine.delgoulet@lecnam.net

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Abstract:
This article provides an analysis of the relationship between the training situation and the work situation that is intended to be mastered at the end of the training, with particular emphasis on occupational health and occupational risk prevention issues. Two levels of analysis are discussed: on the one hand analysis focuses on the “mediations” between work and training, and on the other hand they explore the "internal relevance” of training and the “reciprocal relevance” between work and training. The complementarity of these two levels of analysis is highlighted by two case studies. The particularity of these case studies is that they report on a topic that has not been much discussed in the literature to date: how psychosocial risks at work disrupt training courses. The analysis of the mediations leads to an interest in the different dimensions of the work situations which are the object of the training. The reciprocal relevance makes it possible to analyze what is at stake between work and training. For the two cases examined, the presence of psychosocial risk factors and their consequences for the operators leads us to underline the extent to which daily work has an impact on training and the conditions in which it takes place. Training can also have a positive effect by restricting the current effects of psychosocial risks at work, but it remains local and limited in time.

Keywords: activity analysis, vocational training, training relevancy, mediation, psychosocial risks

Highlights:
-Psychosocial risks in work situations can disrupt training situations.
-Analyzing the mediations between training and work makes it possible to understand the relevance of the training for the management of the targeted work situations.
-The analysis of the “reciprocal relevance” between work and training leads to highlighting some required conditions for training to provide opportunities for learning and occupational health development.
-Training can limit the consequences of psychosocial risks in work situations but it remains insufficient in the medium and long term.

Psychosocial risks have become a major preoccupation in numerous countries, although the regulations and preventive actions implemented are very heterogeneous (Lippel & Quilan, 2011). International agencies conduct surveys to understand their evolution, and provide prevention programs (ILO, 2014), among which the training of the companies’ various stakeholders remains the favoured course of action. For instance, ILO (2012, p. v) offers a very detailed training course whose goal is “*to provide the knowledge and skills necessary to integrate the topics into an occupational safety and health policy and a workplace health promotion action program*”. When it comes to preventing psychosocial risks, the training course can have multiple objectives. It serves as a means of prevention when stakeholders are facing a new task, learning how to master the use of new equipment, taking charge of emergency situations or overcoming the constraints of working in contact with a demanding, versatile, or even aggressive public. Training thus most often aims at doing prevention work through changing the behaviours of professionals (Oakmana, Macdonalda, Bartramb, et al.,

2018). It also serves as a means of prevention when it comes to raising stakeholders' awareness at various levels of an organization, so that they can identify and report hazards, modify a potentially destructive management system, or transform their work organization (ILO, 2014; Rouat, 2019).

In this article, relationship between psychosocial risks and training are examined by focusing on the way in which these hazards, and the disorders they cause, can appear during training situations dedicated to mastering trade-specific professional gestures. Two case studies constitute the empirical material. They are conducted in France in two different work fields: animal testing and patient care. This "casuistry" (Hyett, Kenny, & Dickson-Swift, 2014) highlights the way in which vocational training can contribute to preventing psychosocial risks by being designed based on actual work content and the subjective involvement it generates in stakeholders. Based on the analysis of mediations actually conducted in those training courses, the benefit of designing training systems will be discussed. This analysis is based on two notions defined later in the text: the "internal relevancy" and the "reciprocal relevancy" between those training systems and the work situations they are supposed to help trainees master (Delgoulet, 2000; Delgoulet & Vidal-Gomel, 2014; Delgoulet, 2020). The final discussion proposes to take a step aside in order to consider training centred on professional gestures as a way to prevent psychosocial risks (PSR).

1) From PSR to PSD analysis

Psychosocial risks were defined by ILO as early as 1984: "*Psychosocial factors at work refer to interactions between and among work environment, job content, organizational conditions and workers' capacities, needs, culture, personal extra-job considerations that may, through perceptions and experience, influence health, work performance and job satisfaction*." (1984, p. 3). This definition has been heavily criticized. It was notably deemed too vague, as the very same report underlined from the start: "*The concept of psychosocial factors at work is difficult to grasp, since it represents worker perceptions and experience, and reflects many considerations"* (Ibid.). Although that notion has been more precisely defined since — "*A simpler definition of psychosocial hazards might be those aspects of the design and management of work, and its social and organisational contexts that have the potential for causing psychological or physical harm*" (WHO, 2010, p. 4) — some difficulties remain: the persistent vagueness of the definition and the complexity of those phenomena are part of what impedes the implementation of prevention policies (Leka, Wassenhove & Jain, 2015).

The definition used is that of the WHO's definition (*Ibid.*), specifying that the damages caused by those risks are "psychosocial disorders" (PSD, Van Belleghem, De Gasparro & Gaillard, 2014). Indeed, referring to the model of the double regulation of human activity (Leplat, 1997), which is one of the models of "the French-speaking ergonomists" (Daniellou, 2005; Falzon, 2014), our analysis focuses on the relationships between the characteristics of situations (working hours, characteristics of the provided equipment, quality of prescriptions, working atmosphere, etc.) and people (age, experience, health, etc.), the way in which those characteristics influence the way a person acts in a given situation, and its effects on the sociotechnical system (produced results, acquired experience, pleasure at work, tiredness, weariness, etc.). In this model, the effects produced at time "T" transform in turn the characteristics of situations or people, either transitorily or durably, at short, medium or long term. PSR then depend on the characteristics of the situation, and PSD on the results produced on the person by the coupling of individual and situational particularities during the performance of the activity. In this article the focus is on the way in which what is generically called PSR can appear during a professional training course, and thus more particularly on the

ensuing disorders, or PSD. In these conditions, understanding the way in which PSD can occur during training implies to analyse what is at stake between the training situation designed for learning purposes and the category of work situations that are supposed to be mastered at the end of the training course.

2) From transfer to the analysis of the relationships between work and training

Analysing the transfer between training and work makes it possible to discuss the quality and success of a professional training course. It leads to questioning the relationships between the designed training situation and the category of work situations that are supposed to be mastered at the end of the training course. This article proposes to analyse these transfer issues from two associated perspectives: the relevancy and the mediation between work and training situations.

These issues are generally analysed with the concept of "transfer". It was and it is the object of an abundant literature. Researches make it possible to highlight different variables that influence it (Burke & Hutchins, 2007; Grossman & Salas, 2011; Saks, Salas & Lewis, 2014): the characteristics of trainees (their motivation, their cognitive abilities, their sense of self-efficiency, etc.), the design of the training course and the training methods (including the content of the training course and the type of pedagogy used), and the work environment (atmosphere, colleagues' support, opportunities to implement what has been learned, for instance). Questioning transfer means paying attention to what has been learned during training and how it is reused in a work situation. It thus sets aside occupational health and safety questions that must be answered separately, unless they were specifically targeted during training (Ouellet & Vézina, 2014). Indeed, most of the time, training courses do not make the connection between work content and health and safety questions, thus leaving trainees in charge of articulating and integrating what needs to be, as though it were obvious.

Delgoulet (2020) proposes to integrate those questions by analysing the relationships between work and training from the perspective of the "relevancy" of designed learning systems. This approach takes the transfer into account within a larger reflection that is concerned with the consequences in terms of occupational health and skills development. Conducting the analysis from the perspective of relevancy means insisting on the systemic nature of the questions that are being dealt with: it is not about looking at the terms one to one, but within the framework of their multiple interactions with one another. Moreover, in this perspective, learning is seen as an aspect of the promotion of health at work (Falzon, 2014; Delgoulet & Vidal-Gomel, 2014). More precisely, in line with Vygotsky's works (1978), development is considered within a didactic relationship between maturity, which precedes and underlies learning, and learning which, notably through the mediation of others, can be a factor of development. From this perspective, development throughout life is a dynamic process in which the current potentialities of people are partly conditioned by their past experiences and some of their consequences (vulnerabilities, damages, but also skills, for instance), that notably develop at work through their individual and collective experience (Gaudart & Ledoux, 2014). That creates as many levers or hindrances for the current and future potentialities of individuals and collectives (Herzog, Kramer, Wilson et al., 2009).

The relevancy of learning systems is concerned with two aspects: the "internal relevancy" of the system, which refers to the appropriateness of each situation and condition (material, organizational, human) and their global coherence for learning at work or in training, and the "reciprocal relevancy" between work and training that refers to the appropriateness of the mobilized learning resources with regard to the work goals, and the other way around.

Internal relevancy concerns the adequacy between the training system and the set pedagogical goals, but not only. According to the holistic approach defended in ergonomics (Daniellou, 2005; Vidal-Gomel, Delgoulet, Bocarra & Cau-Bareille, 2019), relying on the model of double regulation of human activity (Leplat, op. cit.) implies paying attention to the characteristics of trainees or trainers involved in the training course, such as their initial level of training and their qualification, their age, their personal project, employment status, seniority, experience and state of health, etc. It is also necessary to take into account the characteristics of situations: the material, financial, human or organisational means mobilized to conduct the training course and the way in which it fits into the institutional project of the training centre and/or the company that provides it. The characteristics of stakeholders (trainees, trainers, mentors, etc.) and situations (e.g. workplace learning, training room, workshop, etc.) influence the learning activity of stakeholders in situation (Leplat, op. cit.). Taking into account all these aspects and their relationships to one another aims at ensuring that the trainees can benefit from the training situations that are offered to them and that the trainers, mentors or peers can work efficiently and can develop their activity (Falzon, 2014; Boccara & Delgoulet, 2015). In a nutshell, questioning the internal relevancy of a training course amounts to asking whether trainees and trainers, mentors, peers can, in those training situations, learn (for the former) and work (for the latter); and whether those situations are "potential situations of development" (Mayen, 1999).

The reciprocal relevancy between training and work accounts for the relationships between the designed training situation and the category of situations that are supposed to be mastered at the end of the training course: Is the designed training course relevant to the actual work situation targeted? Wording the question in this way is not neutral: one of the issues with training courses is that they can rely on "what the work situations should be" instead of "what they really are", at the risk of leaving stakeholders unprepared to face the reality of work. It is the case, for example, of training courses centred on regulated safety (Vidal-Gomel, 2017). It does not mean training sessions should be modelled strictly on work characteristics. Indeed, on the one hand, work situations do not necessarily provide sufficient learning conditions and they can entail risks it is not always appropriate to integrate into the training course. On the other hand, designing training courses based on work characteristics can be an opportunity to identify work situations that could prove to be damaging for the health of operators in the short, medium or long term, and thus encourage the company or institution to take measures to change them (Ouellet & Vézina 2015). Lastly, the analysis of reciprocal relevancy aims at creating opportunities for development through training, considering that the development initiated during training must be pursued at work, this development being seen at once from the learning perspective and the stakeholders' health perspective (Delgoulet & Vidal-Gomel, 2014). Therefore it is not about training individuals to adapt their behaviours to work situations or reproducing all aspects of work situations during training. Fidelity is not a relevant criterion for analysis. These issues are not always addressed by trainers. Indeed, they are not necessarily involved in the design of training situations. They may only be in charge of the implementation, contrary to the situations we discuss in this article.

In line with a body of work focusing on training within a historical and cultural framework (Samurçay & Rogalski, 1998; Rabardel & Samurçay, 2001; Béguin & Pastré, 2002), the internal and reciprocal relevancy between work and training were analysed from the perspective of the mediations offered by training situations, in order to take a better approach to work at the end of the training course.

The notion of mediation can be understood according the initial input of Vygotski (1978), who defines it as an "intermediate link" between the stimulus and the response that transforms the activity: "*The intermediate link in this formula is not simply a method of improving the previously existing operation, nor is a mere additional link in an S-R chain. Because this auxiliary stimulus possesses the specific function of reverse action, it transfers the psychological operation to higher and qualitatively new forms and permits humans, by the aid of extrinsic stimuli, to control their behavior from the outside. The use of signs leads humans to a specific structure of behavior that breaks away from biological development and creates new forms of a culturally-based psychological process*" (Vygotstki 1978, p. 39-40). While Vygotski (op. cit.) makes a difference between technical and psychological tools, Rabardel (1999) shows that some artefacts can become either technical or psychological tools according to the situations. Therefore, he proposes to conduct a detailed analysis of mediations. This point of view is taken over to analyse the various mediations that training situations can offer and that promote development.

Six types of non-mutually exclusive mediations can be distinguished:

- "Formative" mediations provided by the trainer, the supervisor, or a peer who guides the learner as they perform the operations required to fulfil tasks (Samurçay & Rogalski, 1998; Samurçay & Rabardel, op. cit.).
- "Epistemic" mediations directed towards the acquisition of knowledge about the object and its properties (Rabardel & Samurçay, op. cit.; Béguin & Pastré, op. cit.), which are crucial in training, since the goal is to make trainees perform an operation in order to give them the means to acquire knowledge about it. For example, in car driving training, it can be finding out what the turning radius of the vehicle is.
- "Pragmatic" mediations, directed towards the goal of the action, its transformation, its management, etc. that concern the phase where the trainees perform the action (Rabardel & Samurçay, op. cit.; Béguin & Pastré, op. cit.). The corresponding training situations are those where the trainees must supply goods or provide a service, whether it is real or fictitious: e.g., performing a surgical procedure on a dummy or measuring the blood pressure of a peer during training.
- Mediations that Béguin and Pastré (op. cit.) called "heuristic", which concern the relationships the subjects develop with themselves via the designed training situation. Dubey (1997), for example, demonstrates that simulated flight situations enable civil aviation pilots to process their worries regarding the risks inherent to plane piloting. Such simulations thus work as psychological tools in the sense developed by Vygotski (op. cit.).
- "Transpersonal" mediations stemming from the relationships the operator develops with their profession, from a transpersonal history perspective (Vidal-Gomel, in press). For the subject, it means (re)connecting with the history and values of their trade, the ways of talking about things and doing things that make it possible to tell that someone is "in the trade" (Kloetzer, Clot & Quillerou-Grivot, 2015).
- "Collaborative" mediations that are necessary to the development of the skills needed for working in collectives (Samurçay & Rabardel, op. cit.). For example, cross-training consists in experiencing a colleague's position during a simulated work session. This kind of system allows each member of a team to acquire knowledge about the constraints and difficulties of other functions/occupations, thus fostering cooperation and reciprocal assistance and improving the collective's efficiency (Salas & Cannon-Bowers, 2001).

Those mediations try to account for the various conditions required to learn a job: for example, a training course that describes the dangers and hazards of electricity focuses on epistemic mediations without necessarily allowing trainees to learn how they are linked to action in a given situation, which falls into the realm of pragmatic mediations (Vidal-Gomel, 2017). Heuristic mediations would refer to knowledge that the operators could acquire by themselves in a hazardous situation, etc. Therefore, training situations are analysed from the perspective of mediations in order to assess the reciprocal relevancy between training and work.

3) Characteristics of the analysed cases and orientation of the analyses

The approach taken in this article is consistent with an "instrumental case study" (Creswell, 2013; Hyett, Kenny, & Dickson-Swift, 2014). The lessons draw from it will be studied from an "analytic generalization" perspective (Yin, 2018).

Two training situations in which PSR and PSD have occurred with contrasting effects are examined: in the first situation (embryo transfer), PSD interfered with the course of the training program; in the second one ("relational touch"[1]), the trainer feared they would arise, but they only occurred indirectly at the end of the session in this series of training courses – which thus appears as more of a resource to help trainees face the PSR present in their work environment. In these two cases, the analysis focused on unexpected events that occurred during training. Those events were not the initial object of the training course or the study. The two research-action projects were centred on the training system and its internal relevancy (Vidal-Gomel, 2016; Vidal-Gomel, Simon & Nizard, 2018).

Those unexpected events give us the opportunity to analyse the reciprocal relevancy between work and training in those situations, accounting for the questions that arise regarding PSR and PSD.

In the "embryo transfer" study, the event or the series of events studied occurred while trainees were performing in a work situation, which was filmed. The study is based on the observation of operators performing a task they do not master, throughout which they are guided by an expert peer (what it call "training in a work situation"), and on interviews confronting trainees to the traces of their activity, which were also filmed (Mollo & Falzon, 2004). In the "relational touch" study, the implemented system was rather similar to the previous one, but this time, the event occurred once the camera had stopped filming. The available data are the notes taken by the trainer immediately after the training session in her logbook dedicated to the progress of the research project. This logbook was kept regularly from the beginning of the design process for this training course, and notably makes it possible to reconstruct in hindsight events that could not be anticipated and/or filmed (Bolger, Davis & Rafaeli, 2003).

These two training courses are based on similar hypotheses: observations and individual and collective confrontation interviews are used as means of training (Teiger & Montreuil, 1996; Mollo & Falzon, 2004). These confrontation interviews foster the stakeholders' reflexive

[1] In France, the practice of "massage" is the exclusive prerogative of the masseur-physiotherapist profession since 1946. It is a practice that has medical orientations. Massages performed by other professionals are realized in order to increase the well-being of patients They are more a matter of care. They are called "relational touch".

activities as well as the processes that raise their awareness of the action in-situation and the choices that govern it; they are also levers for the development of professional skills (Mollo & Falzon, 2004; Mollo & Nascimento, 2014). The two analysed cases produce a contrast not only because the way in which PSR occur during training is different, but also because their relationship with the trainees' usual work situations is not the same. In the first case, training is provided in a work situation, and some arrangements are proposed. The fidelity of the training situation to the work situation is thus significant, without it meaning that the two situations are exactly the same. In the second case, the training course relies on a simulated situation that does not reproduce every aspect of the work situations; thus, fidelity is less important. In both cases, the relationship between the work situation and the training situation will be analysed from the perspective of the mediations that were implemented in the training situation, then from that of the reciprocal relevancy between work and training.

4) A first type of manifestation of PSD in training: conflicts with the expert-trainer and irritation

4.1. Context of the research study

The research study meets the request of an Animal Research and Experimentation Centre (CREA) that asked for a training course to be resumed after it was interrupted following the promotion of an expert animal technician who assumed the role of trainer (Erwan[2], 17 years of experience). This training course concerned the late collection of bovine embryos (Richard, Hue, Gelin et al., 2014), a new task for two experienced animal technicians (Antoine and Béatrice, 5 and 17 years of experience respectively). Erwan had set up a training in situation: Antoine and Béatrice carried out the operations with his help and his explanations (guidance). This training was interrupted before it was completed when Ewan has been promoted to another center. But since Erwan's departure, they were in charge of collecting on their own the embryos requested by the CREA researchers. They had faced difficulties several times when the animal had anatomical particularities, even minimal ones, which is very often the case. They needed Erwan to complete their training. The task is complex to perform and to learn. It notably implies to insert one or several dilators into the cow's vagina up to the entry point of the uterine horns[3], the animal being put under local anaesthesia prior to the task. The tool is pushed forward with one hand, while the other hand manipulates the genital tract through the wall of the rectum in order to facilitate the operation and avoid hurting the animal. Since these operations are conducted without visual control, animal technicians must learn to identify their haptic sensations in order to control the progression of the tools and the operations performed. They have to "project [themselves] inside the cow", as Antoine says. It is necessary to concentrate in order to perceive the sensations and follow the movements of the cow so that the animal does not contract, which impedes the procedure, as indicated by Erwan.

4.2. Methodology

To facilitate learning, a system was implemented to allow for the training course to be resumed in a work situation: As previously Erwan would provide guidance during the embryo

[2] The names were changed to preserve the anonymity of the people involved.

[3] This part of the task has similarities with artificial insemination, so this video: https://www.youtube.com/watch?v=vDIghmEiVW4, allows a better understanding of this point of the operation. However, insofar as in the collection of embryos the cow has been fertilized, the genital tract is less accessible, and this operation much more complex.

collections. In the new training program, these situations were filmed. One collecting operation implies performing the act on three different cows and lasts four hours when everything goes well. The training is completed by self-confrontations interviews: individual self-confrontation interviews with Antoine and Béatrice separately, then crossed self-confrontations with Antoine and Béatrice together and confrontations with Erwan were then conducted by a researcher.

During the individual self-confrontations (Mollo & Falzon, 2004), Antoine and Béatrice were both asked to comment in depth on what they had done, why and how, notably putting emphasis on the difficulties they had faced when performing the task. Those interviews lasted between one and two hours according to the duration of the recorded collections. Two filmed extracts showing difficulties or raising questions from Antoine or Béatrice were then chosen in agreement with the researcher. During the crossed self-confrontations, Béatrice commented on Antoine's film extract in his presence, and vice versa. This phase aimed at inciting the operators to debate over the difficulties they faced, the various ways in which they could proceed and the benefits of the solutions they could offer when they knew them. Those interviews lasted 30 minutes to an hour.

During the confrontations with Erwan (op. cit.), Antoine, Béatrice and Erwan watched the same extracts together; the objective was to make them debate about the existing difficulties, the possibilities to overcome them, and the different ways to proceed. Those interviews lasted one to two hours. The aim was to deepen the analysis in retrospect, so as to foster reflexive activities and awareness (Mollo & Nascimento, 2014) by relying on the contribution of the various stakeholders: facilitator, peers, expert.

The same system was implemented in all collecting operations that happened over the 18 months of the research-intervention project, i.e. six times in total. The collections and all of the confrontation interviews were filmed with the stakeholders' consent and entirely transcribed.

4.3. Unfoldment of the training course and unexpected events analysed

A difficulty quickly appeared. Antoine and Béatrice often disagreed with the guidance offered by Erwan, but did not say so in his presence. Struggling to perform the task, Antoine refused to listen to Erwan's advice when he told him to insert a second dilator. During the self-confrontation interview, he explained: *"Once the collection is done, we know there is another job for us to do outside […] the more time we spend collecting, the more we lose for the rest of the work, so it's an accumulation of things. […] When you think that afterwards you must clean everything up, disinfect the probes, write down all results, record them and do some more stuff […] and you've been here since 6 am, well, it starts to feel tedious, that's why I don't have any patience left. And that's why you try to find some sorts of *** tricks, and you can see the result on the video. I wanted to insert the probe before inserting another dilator and I ended up having to take everything out and start over from the beginning, and we spent 25 minutes on that if I look at the clock."*

Béatrice accepted Erwan's guidance more easily. But tensions did exist and were expressed through manifestations of irritation when performing the task. For instance, she was a bit brutal with a cow during an operation she failed to perform properly. Yet this does not match her usual behaviour. This brutality can be interpreted as a case of "reactional violence", a sign of PSD (Chouanière, 2006).

During the self-confrontation interviews, she gave other elements of explanation: *"It's tiresome, but since we've been having several nil results, or even times with no embryo at all since last September [in January]"*. Indeed, the number of collected embryos had decreased since Erwan's departure (the average number of collected embryos was of 4,93 before he left; it decreases after his departure: 2,25 during the first year of study and 2,55 in the next six months). At a time when the institution was reorganizing these centres throughout France, these collecting operations were an asset of the centre the two employees work for: *"A rare skill in Europe"*. Informal interviews revealed that the two animal technicians were worried the centre was going to be closed down. Moreover, they had complicated relationships with their management team which had changed several times. They felt that they had to "fight" every day to do a quality job. It was notably the case with the day-to-day follow-up of the herd which can also influence the result of the embryo collections. For Antoine and Béatrice, several difficulties thus accumulated, and can be seen as factors of psychosocial hazards: the feeling that their work load was excessive, the difficulty of doing quality work, the insecurity of their employment situation (Gollac & Bodier, 2011; ILO, 2014).

It was only once this diagnosis had been given and debated over with the trainees but also with their managers that it was possible to resume the training course more serenely. Following that, the trainees made quick progress in learning how to perform the late collection of bovine embryos (Vidal-Gomel, 2016). However, in the long run, the situation deteriorated for several stakeholders of that centre, including Béatrice who suffered from musculoskeletal disorders that caused her to take sick leave for a significant amount of time. Antoine left the centre.

4.4. Mediation and relevancy

In this situation, the PSD that the learners suffer from affect their activity by disrupting three types of mediations:

- Formative mediations exist, Erwan intervenes to help them but its guidance for performing the task is not really taken into account. The disagreement is about the way to perform the task. It is not related to interpersonal tensions between Erwan and the two animal handlers: they meet outside of work.
- Epistemic mediations are also made more difficult: the trainees, preoccupied by the rest of their work load and the results of the collections, and worried about their professional future at the centre, are not focused enough on performing the task. They notably have trouble perceiving the sensory signals required to monitor the progression of the embryo collection tools in the cow's genital tract. As Erwan reports, "they lose their temper" when they ought to stay calm and focused.
- Finally, pragmatic mediations are partly a failure since the actions performed do not always meet the stated objectives. This added pressure for trainees to succeed translates into manifestations of irritation that generate a vicious circle of failure, preventing them from mastering this strategical task.

It is not the training system in itself that makes it possible to change the situation. This change is only effective from the moment the diagnosis has been given and shared with the animal technicians. The interpretative hypothesis adopted is as follows: this diagnosis, by allowing for another interpretation of the difficulties faced in a training situation, generates a heuristic mediation. For example, Antoine explains that *"Of course the problems are still there but it's allowed me to take some distance; I mean, everything is relative."* The learners move from difficulties they have faced and been subjected to, to difficulties they have thought over, and that constitute an experience they can rely on in order to take a more serene approach to the

training course and get involved in the learning process. Indeed, the trainees are not seen losing their temper anymore after that. The animal technicians are able to take breaks while carrying out the collections, while they refused to contemplate such an option before. These breaks, recommended by Erwan, allow the operators to rest from maintaining their constraining postures and appease the animals, which also facilitates the collecting procedure. Finally, Antoine follows the processes suggested by Erwan without needing him to make them more explicit (Vidal-Gomel, 2016).

The heuristic mediations operated are crucial for formative, epistemic and pragmatic mediations.

In that first case, it is necessary to question the internal relevancy of the designed training system, as well as the reciprocal relevancy between this training system and the work situations animal technicians are confronted with. From a design point of view, the material, organizational (duration of the training course, choice of trainer, equipment put at the trainees' disposal, etc.) and immaterial resources (the formative, epistemic and pragmatic mediations considered) seem to meet the training goal, which is to ensure the trainees are able to perform a late collection of bovine embryos. Here, it is more in the implementation and reciprocal relevancy between the training course as it was designed and the reality of the actual working conditions that difficulties and tensions arise. Indeed, the two learners' work load has not been lightened for the duration of the training course, in spite of its crucial importance for the centre. This training course that is forcibly squeezed into their already constrained work schedule increases their feeling of not being able to do a quality job. The two animal technicians are thus faced with a conflict of purposes between learning a new practice that requires them to be attentive and restrained, and providing the service they have not been exempted from by the centre, and that they need to acquit themselves of anyway. They do not have access to the resources they need to resolve this conflict -- for example by arbitrating on the priorities that should be temporarily defined with their superiors. This lack of resources is reinforced by the others factors identified: the feeling that their work load was excessive, the difficulty of doing quality work, the insecurity of their employment situation. This whole contributes to the development of PSD (manifested here by irritability, annoyance, conflictual situations, and in the long term, musculoskeletal disorders) and the mediations totally or partially fail. Here the absence of reciprocal relevance between work and training is characterized by the negative impacts of the working conditions of the two animal workers on the learning process. This absence also prevents trainees from mastering the embryo collection procedure to which the centre owes part of its international fame, which puts it in jeopardy. Ultimately, the deterioration of the operators' health or their resignation validate our interpretations in retrospect.

5) Second type of manifestation of PSD in training: reacquiring the sense of work through training

5.1. Context of the research study

Relational touch training is intended for professional caregivers. The course was co-designed with the trainer (Vidal-Gomel, Simon & Nizard, 2018). It takes two days, with a month-long interval. During the first day of training, the participants are invited to initiate a global reflection process on the importance of touch in the relationship between the caregiver and the patient, in daily care gestures such as mobility-related help, nursing, or more technical medical care. They are initiated to relational touch gestures that, after that first day, they will be able to use in their daily care routine, or even as a care gesture in itself after having

identified a situation that calls for it (anxiety, pain, etc.). The second day of training takes place one month later, so as to give the participants some time to implement relational touch at their workplace. The beginning of the second training session is dedicated to the problems they may have encountered in their endeavours to use relational touch in a work situation. A discussion takes place to look for potential solutions with them.

After that, a role-playing training sequence starts. All trainees are invited to implement a short relational touch technique that can be performed in all care circumstances. The "patient" is sitting on a chair; the "masseur" is standing up. The trainees work in pairs, one providing the massage and one receiving it. The person receiving the massage can offer feedback in real time, which provides valuable information for learning (Leplat, 1970), notably how to avoid eliciting unpleasant sensations in a future real patient. This simulation gives the learner the opportunity to experiment, try things, make mistakes and learn without making a real patient uncomfortable. The massage is applied to the upper limbs, back, nape of the neck, head and face. This relational touch gesture is performed through the clothes.

5.2. Methodology

Six two-day training sessions took place. The sessions gather together 10 to 14 participants who are either registered nurses or orderlies. Each time, the trainer films the role-playing game, focusing on a pair of volunteer trainees. During debriefing, this film is used as an aid to conduct a confrontation interview (Mollo & Falzon, 2004) guided by the trainer. This interview is conducted mainly with the two volunteer actors who were filmed throughout the role-playing game, in the presence of all the other trainees, who can also watch the film and comment on it.

The trainer encourages the actors to comment on the images of their massage. She guides and gets the trainee who plays the role of the masseur to talk about the experience (what they wanted to do, how they did it, how they felt), as well as the one who plays the role of the patient receiving the massage (questioned mainly on how they felt). Every participant is invited to take part in the debate at any time, without judgement. The interview is also filmed with the consent of all the persons present. The trainer also keeps a logbook. The objective of the confrontation is to create the conditions for a collective reflexive analysis. Debating, expressing divergent points of view, and conducting a collective analysis can indeed allow each participant to re-examine their own operating modes, discover others, identify their respective interests and limits, highlight difficulties, share them, and collectively find solutions. The various participants must be able to contribute to it without fear of being singled out or judged. The trainer makes sure that the set framework is respected (Mollo & Nascimento, 2014).

5.3. Unfoldment of the training course and unexpected events analysed

During the simulation, the trainees worked on several dimensions of relational touch (Vidal-Gomel, Simon & Nizard, 2018). This massage aims at getting the patient to relax. It requires the trainees to pay attention to the contact with the patient and its evolution throughout the massage: establishing contact, performing the massage, breaking contact, and maintaining it during the phases of transition between the various body areas the massage is performed on. The way in which pressure is applied during the massage depends on the body area. It requires the masseur's physical involvement, notably to find a balance between the patient's and the masseur's well-being. Different kinds of knowledge are mobilized to get the patient to relax: shared experience-based knowledge of the sensations the patient is feeling, and

knowledge of human physiology. Lastly, the masseurs use various indicators to control their actions: facial expressions, or muscular tensions they learn to identify.

The event studied happens as soon as the camera is off, in a rather similar way during the three sessions. The available data are the notes taken by the trainer about one of those particularly striking moments of expression:

"*Once the camera's been turned off, one of the caregivers starts crying and smiling. I ask her if everything is alright. She tells us what this exercise means for her. She understands now that the core of her profession still exists: taking care of others with empathy, making them feel better. She says that she feels like she is surrounded by wonderful people, she feels like a caregiver among caregivers, and that it lifts her spirits. Four or six other caregivers present have tears in their eyes and agree. They are grateful for the opportunity to participate in this training course that lifts their spirits, they say, and contributes to rekindling their desire to do their job well, a job they chose for the human values attached to it, which they do not find much anymore in their daily work routine. They say that, at the end of the day, even for a short while, they can still establish contact with a patient and make them feel better, take care of them, even if it is not as often as it used to be. They say that there are still things they can do, and they want to develop that in their respective hospital units. They add that these exchanges during the collective confrontation interview are essential, that they lift the spirits and help progress, and enable them to reflect on their care-giving routine to move forward."*

This moment always has a significant impact on the trainer, who dreads it. Initially, she had little awareness of PSRs and understood them only as an obstacle to achieving her objectives, without perceiving what they reveal about the health of the trainees. The end of the training program is a moment when caregivers share their thoughts about their difficulties, in a sector marked by psychosocial hazards in France. Those hazards are notably expressed through the impossibility of doing a quality job and taking care of patients (Estryn-Behar, 2013). These difficulties are reoccurring: in 2005 Alderson recorded the following verbatim accounts: "We perform our nursing tasks with a feeling of dissatisfaction because we can't perform them the way we would like to; so we end up botching them" (p. 82). These difficulties still exist today (Cauvin Renault, 2020). But they are expressed here in another form, and the training course can a priori make it possible to build up resources to deal with them.

5.4. Mediation and relevancy

Mediations can be identified according to the different phases of the situation.
In the phase when the role-playing game was performed, the simulated situation mainly offered pragmatic and formative mediations: the goal was to perform a massage on a peer under the trainer's guidance (Vidal-Gomel et al., op. cit.). The confrontations conducted fulfilled two functions: expressing and understanding what the relational touch gesture was in order to better master it; and giving professionals a moment to share their feelings. As a means of expression and understanding, the confrontations relied on collaborative and formative mediations. The feedback on the two volunteers' feelings, the masseur's goals, their way of performing the massage, etc. was provided under the trainer's guidance. This input was completed and enriched by all of the stakeholders present, which made it possible to bring to light different aspects of relational touch.

It resulted in the development of epistemic and heuristic mediations:

- Epistemic mediations, when the trainees discovered the proprieties of the massage. For example, the importance of maintaining contact:

Trainer (T): Here, I see that when you reach the fingertips during the massage, you put one hand directly back on top of the head, why is that?
Masseur (Me): Well, it's to maintain contact, so she won't feel "abandoned" since she's starting to relax… It's to create a connection, in fact, a continuity, because the fingertips and the head are distant from each other, so it's to avoid surprising her if all of a sudden once we've reached the fingertips, I touch the top of her head again.";

- Heuristic mediations, when they understood how to get physically involved in the action or how to mobilize their psychological resources. For instance, about the way the body weight should be used: *"Yes, it's incredible this pressure with all the weight behind it, it's true that it prevents the masseur from overexerting herself, but it feels much better too, it is much more enveloping, soft and gradual at the same time and the pressure feels good, too!"*

Furthermore, relational touch requires a significant subjective involvement on the caregivers' part. The following data collected during the confrontation interviews account for it:

> Trainee n°1: *"And I'm also attentive, because I want to take care of her, and to take care of someone properly, you have to be attentive, otherwise, it doesn't work! […] You can't pretend! You need to really pay attention to the person".*

> Trainee n°3: *"It's like with every care gesture, in fact, if you're annoyed and you don't want to do it or you're in a bad mood, or you don't click with a patient, they'll feel it straight away. We're human, you know! You need to be in the right state of mind to give someone a massage, otherwise, well I guess it's less agreeable…I think you can't force yourself to do that, anyway."*

The emotions expressed by the caregivers when the camera is turned off also bear witness to their subjective involvement, this time going beyond the performance of the task.
Indeed, the implemented training system has enabled the participants to rethink their profession and its evolutions (*the core of the profession still exists, taking care of others with empathy, making them feel better*) and to give themselves some leeway in order to do their job differently, through exchanges with their peers (*a caregiver among caregivers*), and by putting their professional caregiver identity at the centre of the picture (*taking care of others with empathy, making them feel better*). The confrontations worked as a moment of at least partial re-empowerment of the stakeholders – which depends on the possibility for them to debate and think about the reality of their work (Daniellou, 1998). From this perspective, this phase of the simulation also allowed for "transpersonal mediations": the implemented system made it possible for the participants to reconnect with the history of their profession, its values, and the collective foundations that underlie subjective involvement.

Here again, it is the reciprocal relevancy between the training system and the reality of work that is questioned, more than the internal relevancy of the training system. The material, organizational and immaterial resources mobilized in training allow for effective mediations from a formative, collaborative, epistemic and heuristic point of view. Those mediations attest to the internal relevancy of the learning system. However, these caregivers are brutally reminded of their effective work conditions within the framework of this training course, to the point that it triggers strong emotional reactions that bear witness to their dismay over these conditions. Those reactions call into question the relevancy of the training course with regard to the effective work conditions that are no longer satisfying. The transpersonal

mediations that appear show that this system has the potential to call into question the values of the profession and their mobilization in day-to-day work. They provide immaterial resources to transform everybody's work at an individual level, but do not make it possible to question the organizational choices that prevail in their work environment.

6. Discussion and conclusion

This article has two objectives: it accounts for the complex relationships between psychosocial risks and training and takes up this issue as a way to more generally discuss the relationships between a training situation and a work situation.
Their reciprocal relationships, from the point of view of relevancy, can sum up with a couple of questions: Does the designed training situation make it possible to master the targeted work situation? Does it make it possible to start a development process that can be continued at work and thus become a resource for preventing PSR? The way in which those development possibilities is questioned integrates both learning and occupational health. The conduct of this analysis is supported by a set of mediations that the training situations can generate.

The two cases discussed concern the way in which psychosocial hazards and disorders expressed themselves during training. While training is most of the time considered as a way to prevent psychosocial hazards (i.e various types of stakeholders are trained and made aware of the issue so that they can contribute to the implementation of prevention policies), the two training courses examined had a totally different goal: they aimed at training professionals to perform new professional gestures. Other issues are raised here: the training situations reveal psychosocial disorders that more or less disrupt their course. Any training process can potentially be compromised by psychosocial disorders, whether or not the trainees are aware of them. To our knowledge, this issue has not been much discussed in the field of adult training; therefore, trainers can fail to notice them or be at loss as to how to deal with them.

In relational touch training, the goal is to allow professionals to learn a new technique that they will be able to mobilize at the service of their patients. One might think that crying at the end of the training can have a cathartic function. However, the proposed analysis retains the links that are expressed with the profession and the meaning of the work. The training course touches the core of the profession: care. The results are in line with those of Malet and Benchekroun (2012, p. 12) who state that "*allowing caregivers to be reacquainted with the meaning of care must be the preferred course to preserve caregivers' health by restoring meaning to their work*". From this perspective, training courses that aim at providing "tools" adapted to the daily reality of work contribute to building resources that can be used to deal with situations that present psychosocial hazards.

In this article, training courses were studied from the perspective of the mediations that were made possible and appropriated by the trainees. In the training course about embryo collection, the disorders that affected the operators impeded the learning process. It was only once heuristic mediations were transformed through sharing a diagnosis regarding the existence of psychosocial hazards and their consequences that learning became possible. The formative, epistemic (concerning the discovery of the properties of the object of the action) and pragmatic mediations (concerning the transformations of the object) depended on it.

However, the analysis of mediations is not predictive of the reciprocal relationships between training and work, notably as far as occupational health is concerned. Indeed, even though posing a PSR diagnosis and sharing it with the trainees has built these heuristic mediations, the work situations have not been transformed. Relational touch training provides

transpersonal mediations that make it possible to rethink the profession, its meaning and its values. These mediations seem to be a resource that can be used to work differently, in an environment marked by PSR. Nevertheless, it is up to the trainees to build these resources in a work environment that will only be marginally transformed.

The analysis of mediations leads us to account for the necessity to identify what can be used as a resource on a psychological level when training courses are carried out in work environments that present psychosocial hazards: heuristic mediations that make it possible to change one's own relationship to situations, and transpersonal ones that touch the core of the profession, its meaning and its values. These mediations are of crucial importance to ensure that training is a potential opportunity for development; it is in this respect that mediations account for the reciprocal relevancy between work and training.

However, in this case, the opportunity for development could very well be only transitory. What is at the origin of the stakeholders' problems has not disappeared. The training course is not a substitute for preventive action aiming at eliminating the risk factors (Ouellet & Vézina, 2014; Oakmana, Macdonalda, Bartramb et al., 2018). One hypothesis is possible: the stakeholders' health is going to deteriorate in the long run if preventive actions are not implemented.

Finally, the analyses of the two cases presented do not highlight all the mediations identified in the literature. Collaborative mediations are absent. In the case of embryo collection, different phases of collective work can be observed. But, as these did not pose any problems for the trainees, they were not the focus of the training and analysis. On the other hand, relational massage is an individual task. The collective rather intervenes in other operations of the daily work of the care workers.

Other case studies would be necessary to help us refine our analysis of the relationships between PSR, PSD and training from the perspective of mediations and reciprocal relevancy. However, if training ultimately reveals the existence of PSR, could it become a lever for questioning work and its organization, the third aspect of the reciprocal relationships between work and training? This kind of interrogations calls into question the very conditions in which a training course can be carried out: in the cases presented here, it was thought out independently from work, like the purchase of a punctual service.
More generally, the analysis of training courses based on the concepts of mediation and relevance makes it possible to identify working conditions that may be detrimental or, on the contrary, favourable to the health of trainees (TPS) and that may constitute obstacles or, conversely, resources to training.

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