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# Quantifying efficacy of investigation during a simulated psychiatric interview

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## *Évaluation quantitative de l'investigation lors d'une consultation psychiatrique réalisée en simulation*

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**Short title:** Investigation efficacy in psychiatric simulation

# Quantifying efficacy of investigation during a simulated psychiatric interview

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## *Évaluation quantitative de l'investigation lors d'une consultation psychiatrique réalisée en simulation*

### Abstract

**Introduction:** Simulation is a very promising educational tool. It provides medical students with clinical experience without jeopardizing patients' health. This tool can be implemented in psychiatry training in order to develop interview and specific assessment skills which is why the Université de Lorraine relies increasingly on simulation in teaching psychiatry to its residents. However, there are few objective indicators in that field that make it possible to assess learners. This study aims to assess the relevance of a quantitative measure for objectivising the investigation efficiency by psychiatry residents of a suicidal risk during a simulated psychiatric interview. **Methods:** A simulation exercise was offered to 20 psychiatric trainees from the Université de Lorraine. Their mission was to identify relevant information for assessing and guiding a standardized patient with suicidal risk during a psychiatric interview. The key judgemental criterion was the  $P/Q$  ratio which corresponds to the squared number of relevant items collected by the interviewer divided by the number of questions. When dealing with emergency cases it is indeed important to collect as many key items in as little time as possible. This score was assessed by two examiners based on the analysis of filmed interviews. **Results:** The mean  $P/Q$  ratio was 1.13 (SEM  $\pm$  0.2) and ranged between 0.25 and 2.86. Statistical analysis showed a positive correlation between  $P/Q$  ratio and students' clinical experience ( $r = 0.46$ ,  $p = 0.04$ ). The interclass correlation coefficient (ICC) of the  $P/Q$  ratio between the two examiners was 0.94. **Conclusions:**  $P/Q$  ratio may provide a consistent quantitative measure of a student's efficiency in assessing suicidal risk. Further research is now needed to evaluate its consistency in other clinical cases.

**Keywords:** simulation, psychiatry, suicide, standardized patient, psychiatry residents

### Résumé

**Introduction :** La simulation est un outil pédagogique très intéressant car il permet d'offrir une expérience clinique à l'étudiant en médecine, sans mise en jeu de la santé du patient. Cet outil peut être utilisé dans le champ de la psychiatrie et permettre l'acquisition de compétences d'entretien et d'évaluation spécifiques. C'est pourquoi nous nous appuyons de plus en plus sur la simulation dans notre Université dans l'enseignement destiné aux internes de psychiatrie. Cependant, il existe peu d'indicateurs objectifs permettant d'évaluer l'apprenant. Cette étude a pour objectif d'évaluer la pertinence d'une mesure quantitative de

l'efficacité de l'évaluation du risque suicidaire, par des internes en psychiatrie, lors d'un entretien psychiatrique simulé. **Méthode** : Un exercice de simulation a été proposé à 20 internes de psychiatrie de l'Université de Lorraine. Ils devaient identifier les informations permettant évaluation et orientation lors d'un entretien psychiatrique réalisé avec patient suicidaire standardisé. Le critère de jugement principal était le ratio  $P/Q$ , correspondant au nombre d'items pertinents relevés, élevé au carré, sur le nombre de questions posées au patient par l'étudiant. Dans le contexte de l'urgence, il est en effet primordial de recueillir un maximum d'éléments clés en un minimum de temps. Ce score a été évalué par 2 examinateurs à partir de l'analyse des entretiens filmés. **Résultats** : La moyenne du ratio  $P/Q$  était 1,13 (Erreur Standard  $\pm 0,2$ ) et sa valeur allait de 0,25 à 2,86. Les analyses statistiques ont montré une corrélation positive entre le ratio  $P/Q$  et l'expérience clinique des étudiants ( $r = 0,46$  ;  $p = 0,04$ ). Le coefficient de corrélation interclasse (ICC) du ratio  $P/Q$  était de 0,94 entre les 2 examinateurs. **Conclusion** : Le ratio  $P/Q$  peut permettre d'évaluer de manière quantitative et objective l'efficacité de l'étudiant dans le contexte de l'urgence psychiatrique. Le caractère objectif de ce ratio permet par ailleurs de l'utiliser de manière répétée afin d'évaluer une progression de l'étudiant dans l'exercice. Des recherches ultérieures sont maintenant nécessaires pour évaluer la robustesse de ce ratio dans d'autres contextes.

**Mots clés** : étudiant en psychiatrie, patient standardisé, psychiatrie, simulation, suicide

## Introduction

The practice of psychiatry is largely based on interhuman relations in both diagnosis and therapeutics. Hence psychiatric education cannot be based exclusively on theoretical lectures but has to involve clinical experience. Simulation offers the advantage of providing such experience without jeopardizing patients' health (for a review, see Brenner 2009 (1)). Possible uses of simulation in a psychiatry curriculum include semiology (2), use of standardized evaluations (3), enhancement of focused interpersonal skills (4), and psychotherapeutic learning (5). Brenner (1) pointed out that simulation fits particularly well with the acquisition of focalized technical skills while it has several limits concerning the complex interhuman abilities that are mobilized in psychotherapeutics. The fact is that a psychiatric interview remains a technical action involving specific skills such as wording of the questions, paraverbal communication or time management, which can be enhanced using simulation (1). Moreover, French students have insufficient "know-how" (6).

In order to learn about students' potential to progress on technical skills, several types of evaluation have been tested in the literature. In numerous publications, students' performance is rated by external observers. These evaluations may focus on simple clinical skills such as accuracy of diagnosis (2), or on more complex interpersonal skills (7), and may rely on specific scales (8). Some publications prioritize self-evaluation by the student (9). By contrast, the patient may directly rate specific skills such as empathy (10). However, Mc Lay et al. (11) and Brenner (1) pointed out marked differences between rating by an actor and by external observers. Providing objective and relevant measures on interpersonal skills may therefore improve students' capacity to evaluate their performance and their potential to progress.

A psychiatric interview in the emergency room is a common situation where taking the best decision at the best moment is crucial for the safety of the patient. Indeed, a clinician who precipitates the evaluation may miss decisive aspects which would generate an irrelevant decision. Conversely, an excessively long evaluation may imperil the quality of the therapeutic alliance or thwart the therapeutic process. In brief, such situations call on a specific skill: the capacity to identify a maximum amount of relevant information in a given short time. Young psychiatrists may encounter such emergency situations right from the beginning of their activity, and they are interested in this specific training. In this context, it seems useful to assess their capacity in investigating suicide risk and the evolution of this capacity through years. To avoid halo effect (12), we created an objective evaluation tool that we evaluated through simulation with an actor as patient, in order to have a reproducible situation.

This pilot study aims to evaluate the relevance of a quantified measure of the efficacy of investigation of suicide risk by psychiatry residents during a simulated psychiatric interview. Our main hypothesis assumed that the efficacy of investigation may increase with trainees'

professional experience.

## **Methods**

### Participants

Twenty psychiatric trainees were recruited at the Université de Lorraine between January 2012 and June 2014. The study was proposed during different psychiatry courses. Inclusion criteria were: a valid enrolment for the degree in psychiatry at the Université de Lorraine and at least six months of clinical work.

Written consent was obtained from all participants after being informed. No participant was paid for taking part in the study. No specific authorization was required for this kind of study. There was no potential harm to participants. Anonymity of participants was guaranteed.

### Procedure

The simulations took place in the Simulation Centre of the College of Medicine of the Université de Lorraine. Students were evaluated during four different sessions with five students per session (see Figure 1). They were first briefed about the objectives of the study and the method of simulation. We then provided standardized short information about the context of the clinical situation. The order in which students performed was randomized. While waiting for the simulated interview, students could practice cardio pulmonary resuscitation with two experienced instructors. After the simulated interview, students had an immediate personal debriefing of the situation in order to take the emotional impact of the exercise into account. The students were then asked to answer different questionnaires about the simulation and to write a medical observation about the patient. At the end of the session all students met again with both experimenters (VL & FL) and the standardized patient for a general debriefing.

[Insert Figure 1 here]

The scenario simulated the intervention of a psychiatric trainee in an emergency room. The

situation involved two different actors who did not know each other: an emergency physician, played by an experienced psychiatrist, and the patient, played by an experienced psychiatric male nurse. The students were asked to evaluate the suicidal risk of a patient being offered medical care in an emergency room after deliberately causing a car crash. Trainees were asked to collect as much information as needed to be able to take a clinical decision. However, trainees were not required to formulate the precise decision, especially not during the consultation. This instruction was given in order to fit with the pedagogic objective of the simulation which was to evaluate the efficacy of investigation rather than negotiate therapeutic issues. The actor had memorized a complete description of the patient's biography and his medical and psychiatric history. He was asked to be uncooperative and to have as his sole objective to return home as soon as possible. The standardized time of simulation was obtained after ten minutes when the emergency physician entered the room requiring the psychiatric trainee to leave the room.

The simulation was video- and audio-transmitted into an adjacent room where two investigators and a technician were present. The experimenters could intervene immediately in the event of a major difficulty but which was not required at any time during the study. The experimenters were teachers and not external ones who could be confronted with real-like evaluation situations.

#### Main measure: $I^2/Q$ ratio

During each consultation the investigators (VL and FL) noted the number of relevant items ( $I$ ) in a list of 11 items relevant for a clinical decision which had been previously established based on the script by a panel of four different psychiatrists (BK, JPK, CP, and RS). These items were: social and familial support/financial situation/psychiatric care (history or actual)/actual mood/addiction/impulsivity/suicide attempt history/ dangerousness of disposable lethal means/suicidal intent/premeditation/criticism on suicidal gesture.

The video recordings of all the consultations were then re-examined by the same two investigators in order to calculate the total number of questions asked by the student during the consultation ( $Q$ ) and to verify the number of relevant items ( $I$ ).

The performance of each student was finally evaluated by the  $P/Q$  ratio. The number of relevant information items was squared in order to standardize the range of both variables. Also, we assumed that this indicator remained relevant considering that the probability of obtaining relevant information in response to a question is maximal at the beginning of the consultation but decreases strongly during the time of consultation (Figure 2).

[Insert Figure 2 here]

### Other measures

At the end of each consultation the patient was asked to score a visual analogue empathy scale graduated from 0 to 10, with 0 as minimal empathy and 10 as maximal empathy. He then noted his readiness to follow a therapeutic proposal from the psychiatrist he had just met and the appeasement of internal tension on a visual analogue scale.

At the end of their consultation, the students scored the appeasement of the patient's internal tension on a visual analogue scale ranging from a minimum of 0 to a maximum of 10. They filled in a questionnaire about their perception of the simulation and prepared a brief clinical summary, as generally required in French emergency rooms.

The investigators also scored a visual analogue empathy scale at the end of the consultation.

### Statistical analysis

Statistical analyses were conducted with STATISTICA® 6.1 software (StatSoft Inc.). All the quantitative variables were described by their mean and standard error of the mean. The main variable was the  $P/Q$  ratio, and a Pearson correlation analysis was conducted between  $P/Q$  ratio and the clinical experience of the students to verify the main hypothesis. In order to explore the reproducibility of the  $P/Q$  ratio, the quotation of  $P/Q$  ratio was compared between



the experimenters by the intraclass correlation coefficient. The other variables were analysed with Pearson correlations or Mann & Whitney tests when deemed appropriate.

## Results

Students' experience ranged between 3 and 8 semesters (see Figure 3): 14 (70%) were women, 6 (30%) were men. Their mean experience was 5.3 semesters (SEM  $\pm$  0.37).

[Insert Figure 3 here]

### Main measure: $I^2/Q$ ratio

The mean  $I^2/Q$  ratio was 1.13 (SEM  $\pm$  0.2). The ratio ranged between 0.25 and 2.86. The mean value of I was 6.25. The mean value of Q was 39.45.

The statistical analysis found a positive correlation between  $I^2/Q$  ratio and the clinical experience of the students with  $r = 0.46$  and  $p = 0.04$ . As seen in Figure 4, the more experienced the students the higher the  $I^2/Q$  ratio.

In order to evaluate the consistency of the ratio between the investigators, we calculated the interclass correlation coefficient (ICC) of the  $I^2/Q$  ratio. In our study, the ICC was 0.94 across both investigators. Classically, the ICC ranges between 0 and 1, and a value greater than 0.6 is interpreted as good reproducibility of the indicator.

[Insert figure 4 here]

### Other measures

The mean empathy score given by the standardized patient was 6.95 (SEM  $\pm$  0.32), ranging from 4 to 9. Interestingly, we found a trend towards a positive correlation between this score and the  $I^2/Q$  ratio ( $r = 0.43$ ,  $p = 0.06$ ).

The mean empathy score given by the experimenters was 6.76 (SEM  $\pm$  0.32), ranging from 4.5 to 10. We found a significant positive correlation between this score and the empathy scored by the patient ( $r = 0.5$ ,  $p < 0.05$ ). However, this effect was mainly explained by the

score of one investigator, as a separate analysis showed a strong inconsistency between the observers with a significant correlation for investigator FL ( $r = 0.64, p < 0.005$ ), whereas there was no significant correlation for investigator VL ( $r = 0.13, p = 0.60$ ).

The mean appeasement of the patient's internal tension evaluated by the students was 4.9 (SEM  $\pm 0.56$ ), ranging from 0 to 10. This score was positively correlated with the empathy score for the patient ( $r = 0.5, p < 0.05$ ).

## Discussion

This pilot study aimed to evaluate the relevance of the  $P/Q$  ratio, a quantitative measure for objectivising the investigation efficiency of a suicidal risk in an emergency room. We showed that  $P/Q$  ratio had an excellent inter-investigator reliability and was correlated with the student's clinical experience. In other words, the more experienced the student the more efficient was his investigation as measured by the  $P/Q$  ratio.

Increasing the efficiency of the investigation is crucial in emergency psychiatry to support the medical reasoning (14). We chose here to evaluate the investigation by a ratio depicting the capacity of the clinician to bring out the relevant information from the "noise" contained in a clinical interview. The objectivity of the  $P/Q$  ratio relies on the fact that both components are simply counted during the consultation or the video screening.

Comparison between empathy scored by experimenters and by the standardized patient is interesting. Despite a close correlation between the mean empathy score of both experimenters and the empathy scored by the patient, a separate analysis of the empathy scores of each experimenter revealed that these scores had poor reproducibility. Indeed, empathy scored by one of the experimenters showed no correlation with empathy scored by the standardized patient. This result underlies the utility of highly reproducible and objective scores such as  $P/Q$  ratio.

We assume that using  $P/Q$  ratio fits particularly well with clinical situations such as emergency situations because they require being both rapid and efficient while keeping good quality of the relationship. Using this indicator may help a student evaluate his own progression potential, especially if simulations using this indicator are repeated during the curriculum. However, we also identify some restrictions in its use. Since this ratio mainly evaluates the efficiency of investigation, we consider that it is not relevant enough to evaluate other relational skills of a psychiatrist such as empathy or psychotherapeutic capacities. Also, although this ratio constitutes an interesting and quasi-automatic evaluation, an experimented human follow-up remains irreplaceable.

This study has several limits. The evaluation of our indicator is not based on a comparison of means but on a correlation analysis which could be constructed as an indirect method of measure. We made this choice because there is to our knowledge no similar indicator that could have been used as a comparator. Moreover, the  $P/Q$  ratio was tested with only one clinical situation in this study. Further studies are thus now needed to evaluate its reliability in different clinical environments.

## **Conclusions**

Simulation with standardized patients is a consistent tool that offers vivid experience to psychiatry students without directly exposing a patient. Evaluation through simulation is very interesting because simulation assesses the “show how” (13). In order to progress students also need to evaluate their own performance. Here we provide a consistent, reproducible tool to evaluate efficiency of investigation. Development of other similar tools is now needed to provide students with a multi-criteria evaluation of their performance.

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## Declaration/conflict of interest

All authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as potential conflicts of interest.

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## Figure legends

**Figure 1:** Study design

**Figure 2:** Mathematical function of  $I^2/Q$  ratio. The rapid progression of  $I^2/Q$  at the first questions reflects the higher probability of obtaining important information during the first questions in an intervention.

**Figure 3:** Trainees semesters distribution (N=20)

**Figure 4:** Scatter plot of  $I^2/Q$  ratio (vertical axis) and the clinical experience of the students (in semesters, horizontal axis). A positive correlation was found, indicating that the more experienced the students were, the higher the  $I^2/Q$  ratio.

### Briefing

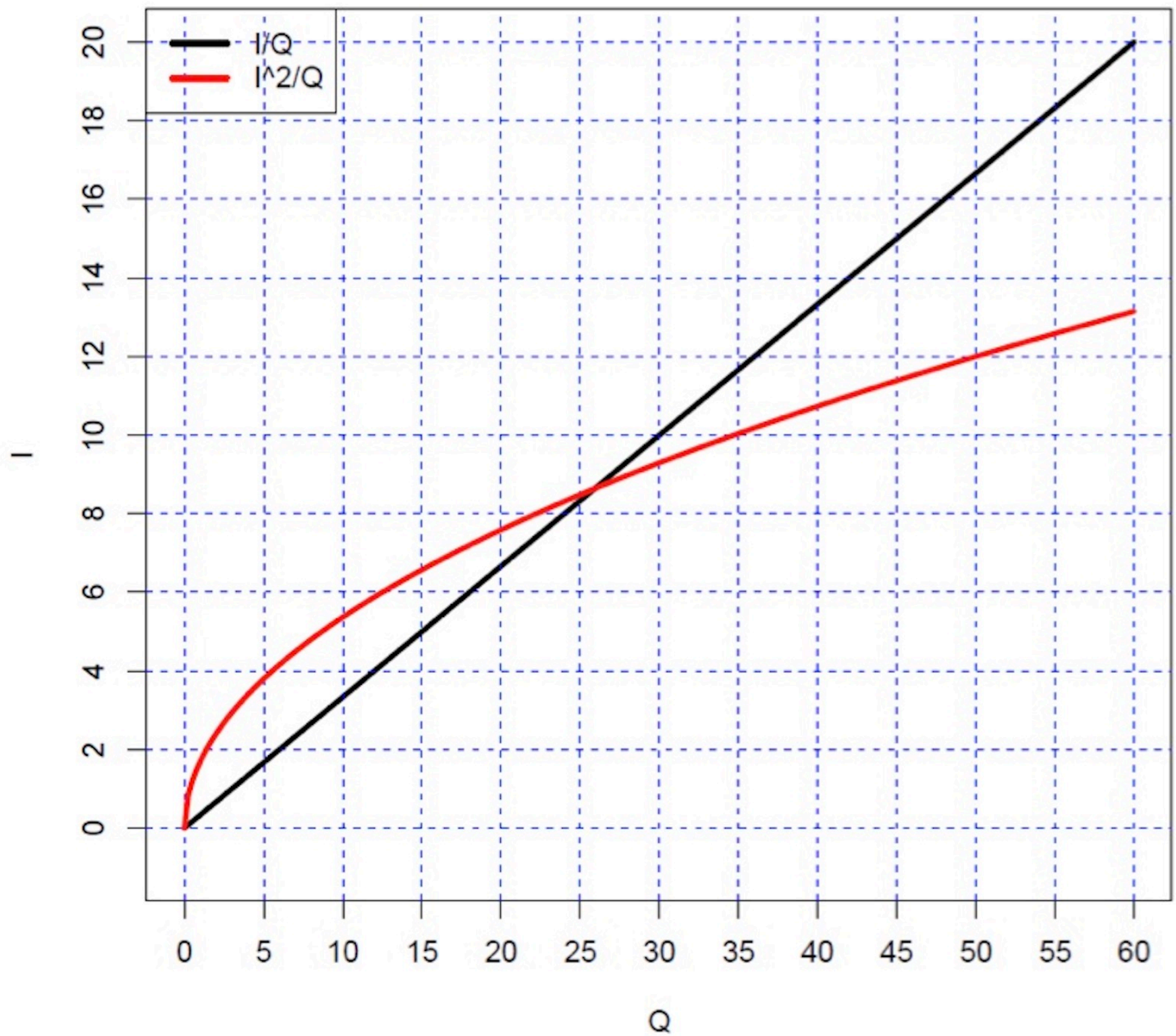
- Simulation Centre of the College of Medicine in Lorraine University
- 20 students: 5 for each session

### Psychiatric interview simulation (10 min)

- One actor, one scenario
- Data collection during simulation: number of relevant items ( $I$ )

### Group debriefing

- Personal debriefing + self-reports before group debriefing
- Data collection after simulation, through video recordings: number of questions asked by the student during the consultation ( $Q$ )



## Trainees semester repartition

