This paper seeks to investigate the effect of increased time on task in simultaneous interpreting on the quality of interpretation and on physiological and psychological stress. Interpreters working for longer than approx. 30 minutes, the recommended turn time in simultaneous interpreting under standard working conditions, risk a decline in quality of output which appears to be due to a combination of psychological and physiological factors.

Introduction

Simultaneous interpreting is a highly complex cognitive activity (Gerver, 1974; Moser, 1978; Paradis, 1994) that requires the interpreter to simultaneously listen, analyze, comprehend, translate, edit and reproduce in real-time a speaker’s utterance. All interpreters work with at least two, many with three or more languages that must be constantly maintained at a high level of proficiency.

During a regular 30-minute turn, working from an original speaker whose speaking speed is between 100 and 130 words per minute, considered more or less comfortable depending on the source language involved, an interpreter processes and delivers final copy of an average of 3000 to 3900 words (equivalent to approx. 12 to 15 ½ type-written double-spaced pages). With fast speakers, speaking at a rate of 135 to 180 words per minute, the interpreter’s output can increase to 4050 - 5400 words, or 16 - 21 ½ pages per
30 minute turn. By way of comparison, the output of translators working as permanents in an international organization or in a company translation service varies between 3 and 10 pages a day.

Over time interpreters have developed working conditions designed to alleviate fatigue and help ensure high quality of output over the course of a normal working day, normal work week and over the course of their career. These include a recommendation that simultaneous interpreters not work alone for longer than approximately 40 minutes for a single speech or short meeting and that they take turns roughly every 30 minutes when working all-day meetings. Although the very nature of conferences today, with many scientific papers following each other in rapid succession, often dictates shorter turns (after each 15 or 20 minutes, i.e. after each paper or presentation), there are also keynote lectures that may last between 30 and 60 minutes. When this is the case, the same interpreters may wish to continue working in order to provide consistent service to delegates to whom a change in interpreters during one and the same speech may appear disruptive.

It is significant that already when simultaneous interpreting was used for the very first time in the fall of 1945 during the Nuremberg trials, working conditions were established by the chief interpreter to guarantee quality and protect the health and well-being of interpreters. The arrangement at the time was to provide for 3 complete teams of interpreters: one worked the trial, the second was on call in an adjacent room and followed the proceedings via intercom to keep informed on the progress of the trial, and the third team was allowed to rest. The teams were rotated every 1 1/2 hours, with two interpreters working in each “booth” (The Nuremberg Trials, 1946).

AIIC, the International Association of Conference Interpreters, built upon the experiences gained in Nuremberg in order to elaborate working conditions that would ensure high quality of output and protect interpreters’ health and well-being (AIIC, 1994). As interpreting, and simultaneous interpreting in particular, evolved, with increased variety in types of meetings, technical congresses, more intense working sessions, long-distance travel to and from conference sites, an ever-increasing number of languages, working conditions had to be adapted to continue to ensure high quality of service and to protect the health and well-being of interpreters. Considerable improvements were made in equipment design, booth design (both fixed and mobile installations, ISO norms), and in sound equipment. Studies on air quality in interpreter booths continue to be carried out to ensure proper working condi-

Regular reviews of working conditions have by and large ensured the kind of quality professional conference interpreters are known to provide. While most interpreters themselves, and many delegates (AIIC, 1994), maintain that interpreting is a stressful activity, much less research has been carried out in this area (Cooper et al., 1982; Klonowitz, 1994; United Nations, 1957). It is generally accepted that minor stress facilitates memory performance, because it raises the baseline level of arousal, however more intense stress produces anxiety; intense stress combined with anxiety creates overarousal which hinders cognitive functioning, including memory performance (Searleman & Herrmann, 1994). Cardiovascular activity measures point to systematic and increased arousal in simultaneous interpreting producing blood pressure changes that mimic those leading to the development of essential hypertension (Klonowicz, 1994:222).

The present study investigates the effect of prolonged turns, those lasting longer than 30 minutes on the quality of interpreters’ output as well as the interaction between prolonged turns and physiological and psychological stress experienced by the interpreters. The investigators based their definition of prolonged turns on the working conditions that had been established and revised over the years by the profession (AIIC, 1994).

Methods used in previous research (Cooper et al., 1982; Klonowitz, 1994) did not lend themselves readily to investigating potential correlations between prolonged turns and stress, because they were either deemed too invasive (Klonowitz, 1994), or not suited for the experimental situation (Cooper et al., 1982). Looking at other cognitively complex activities that had to be carried out under time stress led the investigators to human factors research carried out on air traffic controllers (Seamster et al., 1993) and measurements of workload and psychophysiological stress reactions in air traffic controllers (Zeier, 1994). We were interested in learning first how conference interpreters compared to the normal population with regard to coping with stressful situations in general (questionnaire 1), and second how interpreters’ coping mechanisms manifested themselves in the experimental situation (questionnaire 2). Both of these parameters were investigated with the help of questionnaires. Furthermore, we were interested in comparing interpreters’ perception of themselves on task (questionnaire 2), as evidenced through the second set of questionnaires (and admitted both by themselves and users of interpretation — Moser, 1997) with their physiological stress as
assessed through the concentration of secreted cortisol and immunoglobulin A.

With regard to sample size the authors encountered some of the very same difficulties discussed by Massaro & Shlesinger (1998) and Lonsdale (1998), and which are still characteristic of experimental research in simultaneous interpreting.

This study of prolonged turns and their effects on quality, physiological and psychological stress is the first of a two-part study designed to compare interpreters' performance in prolonged and regular turns.

Subjects

All subjects selected for this study were experienced conference interpreters, with a minimum of 12 and a maximum of 25 years of professional experience in the booth, and an average age of 49 years. All had English as their native language (language A), and German as their passive (B- or C-) language. Five female and three male interpreters participated in the first part of the study. For technical reasons the data of 2 male and 1 female interpreter had to be excluded from the analysis, leaving a final sample size of 5 (3 female, 2 male).

Subjects did not receive financial compensation for participating in the experiment as funding in this emerging discipline is usually quite restricted and as a priority limited funds are allocated to transcribing and analyzing data.

Materials

Texts

Four speeches by German politicians were chosen as realistic source texts. They covered highly topical political and economic issues and had been delivered between August 1995 and September 1995. These issues had appeared in the daily press, both in German and English papers.

All four texts were recorded by a native speaker of German, at a constant rate of 120 words a minute, on a TASCAM 103 grand public recording device
onto audio cassette tapes in the sound-proof recording studio of the Ecole de Traduction et d’Interpretation. They were checked for accuracy and speed by an independent German speaking judge. For experimental reasons input material did not change in quality or quantity during the experiment, whereas the original speeches might very well not have been delivered at a constant speed.

**Recording installation**

The experiment was carried out in the professional interpreting installation of the Ecole de Traduction et d’Interprétation (TELEVIC/ARTEC). This installation provides all the functions that normal conference interpreting installations would provide, but allows, in addition, for recording both the interpretation and the original onto the same cassette. The size of the interpreting booths, sound quality, air quality, visibility, working surfaces all conform to ISO-norms. The interpreters’ output was recorded on Revox E 88 recorders.

**Physiological stress measurements**

Test tubes (salivettes, Sarstedt, Germany) marked with the personal code-number of each subject and containing a small sterile cotton roll were provided before the test session, after 30 minutes and at the end of each test session. Subjects were instructed to remove the test tube stopper, take the rolls out of the test tubes, put them in their mouths and chew them slightly for exactly two minutes. Then they had to push the saliva-filled cotton rolls back into the test tubes, seal the tubes with the stoppers and return them to the investigator. They were immediately shipped to the Ecole Polytechnique Fédérale in Zürich (EPFL, Department of Behavioral Sciences) in order to be frozen until further laboratory analysis could be performed. Instructions for taking the saliva samples were handed out in written form before the experiment. The subjects were instructed not to eat, and to rinse their mouths well with water 10 minutes before the first saliva collection. Smoking was prohibited, but drinks, sweets and chewing-gum were allowed. Test tubes were later thawed in the laboratory of EPFL Zürich and centrifuged in order to extract the saliva from the cotton. The volume of saliva in each vial was recorded. Concentrations of cortisol were determined by laboratory personnel, who had
no knowledge of the experimental conditions of the analyzed samples. Concentrations of free cortisol were determined using the RIA kit Cortisol Coat-A-Count from Diagnostic Products and a gamma counter from Canberra-Packard using the RIA-CALC and 4PL programs (Zeier, 1994).

Psychological stress measurements

Subjects were required to complete process questionnaires, relating to the experimental situation, at the end of the experimental session for the assessment of psychological stress (Reicherts & Perrez, 1993). A standardized take-home questionnaire (Reicherts & Perrez, 1993) that presented the subjects with prototypical stressful situation-sequences (S-R-S-R tasks) was also handed to each subject after the experiment and had to be returned to the investigators within a week. The questionnaires represent a situation-behavior approach to stress and coping, and are designed to capture an individual’s coping mechanisms. The underlying assumption (Perrez & Reicherts, 1992) is that stressful events disturb an individual’s homeostasis: the disturbance begins with the perception of a stressor, which represents a discontinuity in configurations of situation characteristics. Through their intensity and/or duration these changes condition the organism to respond. Characteristics of the stressor can be distinguished from the organism’s perception of these characteristics: stressors can be internal or external in origin and the disturbance of homeostasis can arise from characteristics of the stressor and the perception of it. “The organism reacts to the perceived disturbance with automatic adaptive responses, or — depending on the type and extent of the disturbance — with adaptive actions that are goal-directed and potentially conscious.” (Reicherts & Perez, 1993:18). The entire situation-behavior sequence, or situation-action sequence, including its immediate result — positive or negative — is called a stressful episode, a prolonged turn for the purpose of the current study.

The theory builds also on a taxonomy of coping behavior. The first type of coping behavior is to change the inner or outer stressor directly (taking a valium, e.g.); the second type would change the cognitive representation of the situation (stressor) by suppressing or by searching for information about the stressor. The third type of behavior is volition- and/or evaluation-oriented, i.e. individuals may change their attitude towards a stressful situation. Coping operations can also be categorized into three groups: situation-oriented, with
active influence on the situation, evasion or withdrawal (passivity); representation-oriented, with search for information and/or suppression of information; and evaluation-oriented, with a change of intentions or goals or a re-evaluation of the situation.

Methods

Interpreters participated in the experiment on a day and time chosen by themselves in accordance with their own availability. Evening sessions were excluded. Subjects were given information in advance of the experiment, the titles of speeches together with the dates and the names of the original speakers in order to be able to situate the input material. They were informed of the rationale of the larger study, i.e. to compare extended turns with regular turns in simultaneous interpreting, of the fact that they would undergo stress tests and that take-home questionnaires would have to be filled in and returned. They were asked to budget at least 3 hours for the experiment.

On site, subjects were instructed in the use of the installation, given water and drinking cups for their convenience, as well as written instructions on the saliva tests and told that they should stop working whenever they felt that the quality of their output no longer met their professional expectations.

After the first saliva test the first speech was played and the interpreters started to work. The first break came after 30 minutes, when the second saliva test was administered: total break time was 2 minutes for the test and another minute to change recording tapes in the interpreting booth as well as to change to the second master tape. The next break came at roughly 50 minutes, lasted 2 minutes while the tapes were changed. No subject worked long enough to reach a third break.

Results

Quality of output

All cassette tapes of the interpreters’ output were transcribed. The first 3 minutes and 3 minutes every 12 minutes were then analyzed for quality according to a rating scale adapted for this purpose from similar rating scales
used by researchers in the field of interpreting (Gerver 1974; Barik, 1971).

The rating scale included four categories for meaning errors: *contre-sens* — saying exactly the opposite of what the speaker said; *faux-sens* — saying something different from what the speaker said; nonsense — not making any sense at all; imprecision — not capturing all of the original meaning (leaving out nuances). The scale also contained categories for omissions, additions, hesitations, corrections, grammar mistakes and lexical errors. The ranking of errors in terms of seriousness starts with *contre-sens*, being the most serious, and ends with lexical errors, the least serious. Transcripts were analyzed by two independent judges, the means of their scores were entered in the table.

*Table 1. Total number of errors (n=5, elapsed time = 15 minute segments)*

<table>
<thead>
<tr>
<th>Elapsed time (min.)</th>
<th>0-3</th>
<th>15-18</th>
<th>30-33</th>
<th>45-48</th>
<th>60-63</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>contre-sens</em></td>
<td></td>
<td></td>
<td>2.5</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td><em>faux-sens</em></td>
<td></td>
<td>8.5</td>
<td>3.5</td>
<td>9.5</td>
<td>16</td>
</tr>
<tr>
<td>nonsense</td>
<td>3.5</td>
<td>6</td>
<td>9.5</td>
<td>12.5</td>
<td>12</td>
</tr>
<tr>
<td>imprecision</td>
<td>7.5</td>
<td>11</td>
<td>7.5</td>
<td>6</td>
<td>3.5</td>
</tr>
<tr>
<td>omission</td>
<td>59.5</td>
<td>75</td>
<td>50</td>
<td>70.5</td>
<td>80</td>
</tr>
<tr>
<td>addition</td>
<td>16.5</td>
<td>8</td>
<td>5</td>
<td>6.5</td>
<td>2.5</td>
</tr>
<tr>
<td>hesitation</td>
<td>4.5</td>
<td>11</td>
<td>7</td>
<td>3.5</td>
<td>8</td>
</tr>
<tr>
<td>correction</td>
<td>20</td>
<td>11</td>
<td>10</td>
<td>8.5</td>
<td>9.5</td>
</tr>
<tr>
<td>grammar</td>
<td>9</td>
<td>8.5</td>
<td>7.5</td>
<td>12.5</td>
<td>8</td>
</tr>
<tr>
<td>vocabulary</td>
<td>19</td>
<td>19</td>
<td>14.5</td>
<td>15.5</td>
<td>17</td>
</tr>
<tr>
<td>TOTAL per sample</td>
<td>139.5</td>
<td>158</td>
<td>117</td>
<td>150</td>
<td>161</td>
</tr>
</tbody>
</table>

Looking at the total number of errors we can see that frequency increases from 3 minutes to 30 minutes. After 30 minutes there was a break for saliva tests and tape change; then the experiment resumed with a new speech, after which the total number of errors declined (30-33 minutes), only to rise rapidly to the same level as after 15 minutes, and to continue to climb with time on task. It should be borne in mind that speeches often tend to be easier in the beginning as speakers try to provide a general introduction to their subject; this appears to have influenced the decline in total number of errors at 30 minutes.

However, if we single out the category of most serious errors, i.e. meaning errors, the picture changes quite dramatically and we can observe a continuous rise in meaning errors with increasing time on task. At 60 minutes
Meaning errors (all types)

Figure 1. Meaning errors

subjects had committed a total of 32.5 meaning errors. Considering that each meaning error, no matter how minor, does distort the message, a considerable increase in the number of meaning errors after 30 minutes on task does represent a significant decline in output quality. The interpreters appeared to be unaware of this decline in quality, as 3 out of the five subjects included in the current analysis continued on task for another 30 minutes. This same lack of awareness of deterioration in quality can be seen in less experienced interpreters as well: students are usually unaware of how poor their performance can become with increasing time on task. With moderately advanced students, the point of diminishing returns appears usually after 10 to 15 minutes, as they have not yet developed the type of efficient processing strategies professionals have. Increased automation of sub-processes leads to more efficient utilization of cognitive resources and novices usually still have a long way to go (Moser-Mercer & Künzli, 1995). One must conclude that the professional interpreters included in this analysis decided to stop only once their fatigue level had reached such proportions that they felt unable to continue. This demonstrates that interpreters’ own judgment of output quality, whether they are novices or experts, is extremely unreliable after increased time on task.

Physiological stress

The analysis of cortisol measurements taken at the beginning, after 30 minutes on task and at the end of extended turns revealed the following picture:
Table 2. Cortisol and Immunoglobulin concentrations

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>0 minutes</th>
<th>30 minutes</th>
<th>end of task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cortisol (nmol/l)</td>
<td>5</td>
<td>10.6</td>
<td>12.5</td>
<td>9.0</td>
</tr>
<tr>
<td>Immunoglobulin A (mg/dl)</td>
<td>5</td>
<td>5.0</td>
<td>10.5</td>
<td>8.7</td>
</tr>
</tbody>
</table>

These results show a remarkable trend towards adaptation to the task. Secretion of cortisol and immunoglobulin A increased during the first 30 minutes, indicating an increase in physiological stress compared to the beginning of the experiment. With further time on task (30-60 minutes) secretion of cortisol and immunoglobulin A decreased, a physiological trend that was accompanied by a significant decrease in performance quality. Despite the fact that the input material did not change in quality or quantity (speed at which speeches were delivered), the interpreters nevertheless experienced, on the physiological level, an “increase” in workload compared to the first 30 minutes on task, as increasing fatigue took its toll. At 60 minutes, values decline below pre-session levels, which may be an indication of burnout behavior: mental overload may change the interpreter’s attitude towards his job, less effort is expended and a certain carelessness sets in (for similar results and conclusions regarding air-traffic controllers see Zeier, 1998). The decline in stress hormones at 60 minutes on task correlates with considerable anecdotal evidence from professional interpreters who will readily admit that, if put in a situation where they have to exceed their personal limits, they just could not care less after a certain time. Given the unreliability of introspection (Massaro & Shlesinger, 1998; but see Hoffmann, 1998, with regard to potential uses of introspective methods in interpreting research), this will require further empirical corroboration.

Psychological stress

Psychological stress was measured with two different questionnaires: a general questionnaire describing four everyday life situations and a questionnaire linked to the experimental situation.

General questionnaire (Questionnaire 1)

The values obtained were grouped into different categories: appraisal of the situation (ability to control and/or change a situation, negative evaluation of a
situation); emotional reactions (anxiety/nervousness, depression, aggressiveness/anger); coping goals and intentions (actively influencing situation vs passivity; self-directed coping — search for information, information suppression, re-evaluation of information, blaming self or others, palliation). The standard questionnaire allows subjects to report their appraisal of situations, their emotions, coping intentions and coping efforts with respect to standard stimulus episodes that describe the course of a stressful life event in three stages. The results reflect probable reactions to hypothetical situations and reveal the effects of type of stressor (short-term social aversive vs. long-term loss and failure events), of process (the course of the stressful episode) as well as any interaction between the two.

The values obtained from the subjects were compared to reference values obtained from a representative sample of German-speaking Swiss nationals. The mean values for the interpreters in the experimental group appeared to be similar to the reference values for a number of parameters such as emotional reactions and self-directed coping.

Nevertheless, interpreters’ mean value for appraisals of changeability of a situation was considerably lower, and their mean value for ability to control a situation was lower than the respective reference value.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>reference values (Stanine)</th>
<th>experimental values (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changeability</td>
<td>5</td>
<td>3.25</td>
<td>0.900</td>
</tr>
<tr>
<td>Controllability</td>
<td>5</td>
<td>2.25</td>
<td>2.188</td>
</tr>
</tbody>
</table>

Interpreters’ values for changeability are markedly lower than expected according to the reference population norm (i.e. reference value = 5). This seems to indicate that interpreters felt they had little control over the situations described in the standard questionnaire and that in their opinion these situations were rarely going to change.

Interpreters also differed markedly from the reference group in terms of their intentions to cope with a situation (actively influencing the situation vs passivity, evasion behavior).
Table 4. Values for Passivity and Evasion behavior and Active Influence on Situation

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>reference values</th>
<th>experimental values (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passivity</td>
<td>5</td>
<td>1.625</td>
<td>6.75</td>
</tr>
<tr>
<td>Evasion</td>
<td>5</td>
<td>1.625</td>
<td>7.50</td>
</tr>
<tr>
<td>Influence</td>
<td>5</td>
<td>2.156</td>
<td>1.75</td>
</tr>
</tbody>
</table>

Interpreters displayed much more passive and escapist behavior, as evidenced by significantly higher values for these two variables, and their reported attempts at actively influencing the stressful situations described in the general questionnaire were far below the average. According to other results (Reicherts & Perrez, 1993) this pattern, which differs from the norm, is often encountered in pathologic states such as high depressiveness and high anxiety. The above results could be interpreted as representing a potential threat to the mental health of interpreters.

*Questionnaire relating to the experimental interpreting situation (Questionnaire 2)*

This questionnaire, although similar in its conception, related directly to the experimental situation and subjects were requested to respond to questions that related to the different phases of the experiment: the beginning of the interpreting experiment ($t_0$), after 30 minutes ($t_1$), and after 60 minutes ($t_2$). For a number of parameters, such as ability to control a situation and ability to change a situation, the questionnaire related only to the first two phases (see Fig. 3), since only those two were relevant.

*Emotional reactions*

The data related to the level of overall stress emotions or negative emotions (anxiety/nervousness, depression, aggressiveness/anger) show a significant increase ($p<0.015$) between the beginning and the end of the interpreting situation, with a more pronounced increase between $t_0$ and $t_1$ (Figure 2). This correlates with an increase in stress hormones (cf. Table 2).
Appraisal of the situation
The data reveal a pronounced interaction between negative valence (increasing) and the perception of changeability and controllability (decreasing) between $t_0$ and $t_1$ (Figure 3). Although these values do not reach significance they confirm a trend that is consistent with the values obtained from the general questionnaire.
Coping goals and intentions

Overall passivity at $t_0$ was higher than expected on the basis of data from the general questionnaire, with a subsequent non-significant decrease ($p<0.3711$) between $t_0$ and $t_1$, while the tendency to avoid the situation increased non-significantly during the same period ($p<0.3173$). These trends are of descriptive value only (Figure 4), but they prompt us to consider interpreters' coping style. They are often exposed to objectively uncontrollable situations, especially when engaged in simultaneous interpreting, thus coping strategies such as not engaging in any attempt to actively influence the situation (passivity) or trying to avoid the situation altogether (evasion) are functional (Perrez & Reicherts, 1992). However, the data obtained from the general questionnaire lead us to believe that interpreters develop a tendency to perceive even objectively controllable situations as uncontrollable and therefore apply non-functional coping strategies.

![Figure 4. Coping goals and intentions](image)

Discussion

The study of prolonged turns in interpreting provides valuable information as to the development of quality of output. The increase in the number of meaning errors combined with interpreters' lack of awareness of this drastic decrease in quality shed some light on the validity of interpreters' judgment of their own output quality. It appears that interpreters, at least on prolonged
PROLONGED TURNS IN INTERPRETING

turns, cannot be trusted to assess their performance realistically. This lack of judgment appears to be the result of cognitive overload: a situation in which the interpreter tries to economize on processing capacity and allocate resources only to those parts of the interpreting process that will ensure continuous output (irrespective of the quality provided). It is only after mental fatigue reaches a high enough level that interpreters realize that they have no more resources to allocate, or that whatever resources they have left are insufficient to guarantee the high level of quality they are used to provide. We can conclude from this that shorter turns do indeed preserve a high level of quality and that interpreters cannot necessarily be trusted to make the right decision with regard to time on task beyond what has been established as a sound working condition by the profession over time.

It might be useful to note that sometimes decisions to decrease turn time may depend on the degree of familiarity between booth mates, with friends feeling more empowered to adjust turn time to the difficulty of the task, while relative strangers feel more inhibited to decrease turn time. This demonstrates that extraneous factors, which were not the subject of this study, might also play a role in deciding on turn-taking.

If interpreters cannot necessarily be trusted as to how much time they should spend on task, it is unlikely that conference organizers would be capable of judging, unless they are delegates themselves. Delegates, when queried as to the ideal working time for interpreters, by and large feel that the interpreter ought to decide (Moser, 1995), or else give a figure that roughly corresponds to the 30-minute turn time habitual in the profession (AIIC, 1994). Experience has shown that they can rarely be credited with sound judgment as to interpreters' working conditions.

As to interpreters' physiological and psychological responses to increased time on task at least two tendencies emerge: Interpreters seemed to experience an increase in stress emotions (anxiety, depression, aggressiveness) during the first 30 minutes, but as task overload set in responded with an "I-couldn't-care-less"-attitude, evidenced by their tendency to avoid the situation altogether. This is borne out by anecdotal evidence according to which interpreters try to deflect responsibility for the quality of output when they consider the demands to be unrealistic; this would include increased time on task, extremely fast speakers, unintelligible speakers, and long working hours. These two tendencies would certainly explain the increase between $t_0$ and $t_1$ and the subsequent decrease between $t_1$ and $t_2$ in Cortisol and
Immunoglobulin A levels beyond the normal time on task. As Zeier (1998) notes:

Analogous to the above mentioned burnout behavior of some air traffic controllers, mental overload in simultaneous interpreting may change the attitude to the job. It is less seriously taken, a certain carelessness occurs. This might be an effective self defence mechanism against mental overload. It seems to occur rather automatically, without being noticed by the performing interpreter. (Zeier, 1998:247)

The lower values obtained by interpreters for their efforts to actively influence a situation, whether it be a stressful situation in general or the interpreting situation, may in effect be a contributing factor, which together with cognitive overload as time on task increases, produces the decrease in performance observed in this study.

**Conclusion**

This study of prolonged turns and their effects on quality, physiological and psychological stress in interpreting, which is the first of a two-part study designed to compare interpreters’ performance during prolonged and regular turns, has provided evidence for the negative effects prolonged turns (those lasting longer than 30 minutes) have on the quality of an interpreter’s output and on his attitude towards the task. It is especially noteworthy that while on task interpreters do not seem to be sufficiently aware of the decline in quality that occurs in the course of prolonged turns so as to quit when given the opportunity to do so. We can only speculate about this phenomenon: Perhaps cognitive overload, coupled with a below-than-average willingness on part of interpreters to actively influence the course of an event, forces the interpreter to invoke processing strategies that allow him or her to focus only on the essentials, or to leave out seemingly irrelevant material, or to just “catch what I can and leave the rest out”. Even if we subtract from the potentially stressful experimental situation, interpreters’ performance in this study confirms that working beyond one’s limits, and those established pragmatically by the profession over the years, is stressful and produces inferior quality.

While the complexity of this study, with multiple measurements, ultimately reduced the number of subjects included in the final analysis to five, the authors believe that the trends observed could nevertheless provide important insights into the phenomenon of prolonged turns.
Note

The authors wish to acknowledge the support of Prof. Hans Zeier, EPFL Zurich, for carrying out the stress hormone analyses, and of Prof. Michael Reicherts, University of Fribourg, for his advice and support in carrying out the psychological stress analyses. Their contribution to this study was highly appreciated.

*Université de Genève
Ecole de Traduction et d’Interprétation*

**References**


communication (pp. 353-368). New York: Plenum Press.


*The Nuremberg Trials*. (1945-46). (Film) Original footage from the Nuremberg trials as well as interviews with chief-interpreters at the time. Geneva: AIIC archives.


