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The power of clinicians' affective communication: How reassurance about non-abandonment can reduce patients' physiological arousal and increase information recall in bad news consultations. An experimental study using analogue patients ?

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ABSTRACT

Objective: The diagnosis of incurable cancer may evoke physiological arousal in patients. Physiological arousal can negatively impact patients' recall of information provided in the medical consultation. We aim to investigate whether clinicians' affective communication during a bad news consultation will decrease patients' physiological arousal and will improve recall.

Methods: Healthy women (N = 50), acting as analogue patients, were randomly assigned to watch one out of the two versions of a scripted video-vignette of a bad news consultation in which clinician's communication differed: standard vs. affective communication. Participants' skin conductance levels were obtained during video-watching, and afterwards their recall was assessed.

Results: While the diagnosis increased skin conductance levels in all analogue patients, skin conductance levels during the remainder of the consultation decreased more in the affective communication condition than in the standard

condition. Analogue patients' recall was significantly higher in the affective condition.

Conclusion: Breaking bad news evokes physiological arousal. Affective communication can decrease this evoked physiological arousal and might be partly responsible for analogue patients' enhanced information recall.

Practice implications: Although our findings need to be translated to clinical patients, they suggest that clinicians need to deal with patients' emotions before providing additional medical information.

Abbreviations

- AP, analogue patient;
- SCL, skin conductance level;
- SNS, sympathetic nervous system

1. Introduction

The devastating diagnosis of incurable cancer has a major effect on patients' well-being [1], and drastically alters patients' perspective on the future [2]. Patients have to cope with a life limiting illness and many decisions are to be made [3], [4] and [5]. The impact of a bad news consultation is evident and patients often report strong emotions, such as anxiety [6] and [7] and depressive feelings [7] and [8]. However, emotional arousal might not be limited to self-reported psychological arousal. There is growing evidence that the body reacts to mental stress as well [9], [10], [11], [12], [13] and [14]. Stress, negative thoughts and emotions, as for example evoked by the diagnosis of incurable cancer, may activate the sympathetic nervous system (SNS) [15], [16], [17] and [18]. As a subsystem of the autonomic nervous system, the SNS controls visceral functions and operates mostly unconsciously. Activation of the SNS leads to the so-called **fight-flight response**, which increases physiological arousal and prepares the body for action [18] and [19]. Physiological arousal is an important underlying component in emotional experiences [15] and [16] and is expected to influence memory of provided information [18].

Indeed, patients' recall of medical information is problematic: on average patients forget about 40 to 80% of the provided information [5], [20], [21], [22] and [23]. Previous research reported that only 49 to 83% of newly diagnosed cancer patients were able to recall provided information about the proposed treatment correctly [21]. In older cancer patients, recall is even worse; only 21.9% of recommendations nurses made in a consultation about chemotherapy were remembered [5]. The emotional arousal, evoked by the bad news, might be responsible for the poor information recall during medical consultations [5]. Emotional arousal promotes focussing of attention on the source of arousal (**attentional narrowing**), thereby reducing processing of more peripheral details. As a result, memory for information that is directly connected to the emotional event (central information) will be better than memory for more peripheral information [18] and [24]. In case of bad news consultations this

might imply that information about diagnosis and prognosis (central information) is better remembered than, for example, information about treatment options, side effects and implications for the patient (more peripheral information compared to the diagnosis and prognosis). However, to deal with the difficult decisions associated with an incurable cancer diagnosis, knowledge about the remaining palliative treatment options and their side effects is essential [3] and [25]. Patients mainly rely on the information provided by their clinician to make such treatment decisions [26].

Addressing patients' emotional arousal in clinical communication, for example by means of affective communication, might be a promising starting point to both lower physiological arousal and improve patients' information recall. Clinicians' affective communication consists of several components including empathy, reassurance and support [27] and proved to reduce (analogue) patients' self-reported anxiety [6], [7], [28], [29] and [30]. Adler hypothesised that affective communication has the potential to lower physiological arousal [31]. Evidence from psychophysiological research on social interactions indeed points in this direction. Affective communication creates an atmosphere of positive affect, social support and trust [32], which in turn seems capable of decreasing stress-induced physiological arousal [33], [34], [35], [36] and [37]. Due to its expected potential to reduce physiological arousal, affective communication might be particularly suitable to improve patients' recall of provided information. Besides, a recent study from our group showed that clinician's affective communication can reduce (analogue) patients' anxiety and improves their information recall [38].

This study aims to test in an experimental design whether clinicians can lower (analogue) patients' physiological arousal and improve their recall of provided information in a bad news consultation by means of affective communication.

2. METHODS

2.1. Design

This study has a randomised experimental design using two versions of scripted, role-played video-vignettes of a bad news consultation. These versions only differed in clinician's communication: affective communication vs. standard communication. Participants acted as analogue patients (APs), i.e. they watched one of the two videos and were asked to identify with the patient in the video.

2.1.1. Analogue patient paradigm

Following previous studies [6], [28] and [29], the AP approach was chosen because for obvious ethical reasons it is not possible to manipulate clinicians' communication in real clinical bad news consultations. The validity of this methodology has been supported by indirect evidence for the existence of a mirror-neurons system in humans; observing other peoples' emotions, for example in videos, leads to similar activation patterns in the brain as experiencing the observed emotion [39] and [40].

A recent systematic review of our research group concluded that the use of scripted video-vignettes including APs is indeed a valid approach [41]. The validity of psychophysiological measurements in this methodology is confirmed in an empirical study, which showed that APs had similar psychophysiological responses when participating in a videotaped medical consultation, as while watching that same consultation [42]. Most studies in clinical communication research use a correlational design, preventing causality analysis. Besides, physiological responses are seldom examined as an objective measure of patients' emotional arousal [43] and [44]. Using an experimental design allowed us to assess causality and conduct physiological measurements.

2.1.2. Videos

This study was part of a larger project for which different scripted video-vignettes of a consultation were developed, addressing the transition from curative to palliative care. In this consultation, a middle-aged white oncologist discloses an incurable breast cancer diagnosis to a middle-aged female patient, who is accompanied by her husband. Subsequently, prognosis, treatment options, and implications for the patient (e.g. side effects, and day to day routine during treatment) are discussed. To facilitate the identification of the APs with the video-patient, the consultation was preceded by a **priming** scene in which the video-patient introduces herself and expresses her feelings towards the upcoming consult. The scripts for the vignettes were based on a previous qualitative study [45]. A detailed description of the process of creating and validating the (role-played) vignettes is provided elsewhere [46].
For this study, the existing vignettes were supplemented with an extra segment in which the treatment was discussed in detail. This segment was analysed by an expert panel (oncologist and a communication expert) to ensure its internal and external validity. Two videos were constructed (standard communication: 579 s vs. affective communication: 617 s). No so called 'filler communication' was used to compensate for the difference in length between videos. Real clinical consultations with more or less affective communication also differ in length and 'filler communication' might not be neutral and unintentionally influence APs' reaction to the video [46]. APs were randomly allocated to watch one of the two videos. The first part of the video (including the delivery of the bad news itself) was identical in both conditions. In the second part, clinician's communication was manipulated. Clinician's communication included empathic remarks in the affective condition, whereas these remarks were absent the standard condition (see Table 1). Clinical empathy is not limited to understanding a patient's feelings, communicating and acting upon this understanding are as important [47]. Therefore the inserted remarks not only convey empathy and clinician's affect, they specifically focus on reassurance (communicating) and ongoing support (acting). Non-verbal communication was not explicitly manipulated in this study; non-verbal communication supported verbal communication in all vignettes.

2.2 Participants

Fifty healthy women were recruited through notices on message boards in local supermarkets and snowballing procedures. Only women were included to avoid confounding gender effects, which are often present in clinical communication [48]. Moreover, breast cancer is most common among women and the video depicted a female patient. Participants were eligible if they never had cancer, were between 18 and 65 years of age, and if they were fluent in Dutch. Participants received €20,- for their participation.

2.3. Measures

2.3.1. Background characteristics

Before the experiment, participants' background characteristics (age, nationality, education, occupation, marital status) were assessed.

2.3.2. Manipulation check

To validate the effectiveness of the manipulation of clinician's affective communication, three items aimed at measuring various aspects of affective communication (empathy, non-abandonment by the clinician, and reassurance of support) of an adapted version of the QUOTE-COM questionnaire [49] were used. Participants rated clinician's performance on a 4-point Likert scale (e.g. "The doctor showed empathy", 1 = **not**, 2 = really not, 3 = really yes, to 4 = **yes**). These items were added to the (recall) questionnaire participants received after the video-watching.

2.3.3. Skin conductance level

Before and during video-watching, participants' skin conductance level (SCL) was measured to assess physiological arousal. SCL was selected since electrodermal activity provides a relative direct representation of SNS activation [15] and [50]. Besides, SCL is a good indicator of emotional arousal. Previous research reported a positive correlation between self-reported emotional arousal (anxiety) and SCL [15] and [19]. SCL was measured in microsiemens (µS), using the BIOPAC MP150 system, which was connected to a Windows 7 operated computer running Acknowledge 4.1 data acquisition program and Observer XT 10.0 (Noldus). The Observer program allowed us to synchronise SCL measures with the video-watching procedure. The BIOPAC GSR100 C transducer module was used for exciting a 0.5 V constant current and 200 samples per second were recorded. Disposable gel finger electrodes (type: Ag–AgCl, contact area: 1 cm diameter) were placed on the second and third finger of the subject's non-dominant hand.

2.3.4. Recall

A recall questionnaire containing 22 questions was developed. The questionnaire included a mixture of open-ended questions and completion items (active recall), and multiple-choice questions (recognition). The questionnaire was pre-tested on two individuals; three items were adjusted based on this pilot test. A codebook was created to score recall using three categories: correct recall (2 points), partly correct recall (1 point) and no recall/incorrect recall (0 points). MS and MO coded all responses. A third coder (LV) coded five items independent of the other coders, to reassure reliability. Interrater reliability was considered satisfactory (K = 0.85; range = 0.25–1.0) [51].

2.4. Procedures

This study was approved by the Medical Ethical Committee of Utrecht University. All participants were blind to the study aims and the condition they were assigned to via alternating enrolment. Upon registration, participants completed an online questionnaire at home assessing background characteristics. The experiment took place at the Netherlands Institute for Health Services Research (NIVEL) and lasted approximately 1 h. First, participants were welcomed and informed about the study procedures. Informed consent was obtained. After hands and wrists were cleaned with soap, electrodes were attached to measure SCL and participants were connected to the BIOPAC equipment. Participants were instructed to not move their hands, as this may affect measurement of SCL. Before and during video-viewing, SCL was obtained. When baseline measurement was completed (4 min), participants watched one of the two videos (approximately 10 min). After video-viewing, participants were disconnected from the BIOPAC equipment and received the recall questionnaire (approximately 20 min), followed by the manipulation check questionnaire (approximately 10 min). Finally, participants were debriefed and thanked for their contribution.

2.5. Data-analyses

The videos contained four important time points for data-analyses. At 150 s (T1) the clinician disclosed the bad news; this section of the consultation ended at 176 s (T2). Clinicians' affective communication differed between 320 s (T3) and the end of the consultation (T4) in both videos. All statistical analyses were preformed at a significance level of **a** = 0.05 (two-tailed), using STATA 11.

2.5.1. Background characteristics

T-tests and chi-squared tests were used to assess differences in background characteristics.

2.5.2. Manipulation check

The conditions were compared using chi-squared tests, to analyse the effectiveness of the manipulation.

2.5.3. Skin conductance level

SCL of all 50 subjects was analysed. Individual data was freed from obvious artefacts (mostly due to movement) and corrected for participants' own baseline SCL (150 s before start of the video), using Microsoft Excel. The first part of the video (before T3) consisted of breaking the bad news and was identical in both conditions. Therefore, the effect of breaking bad news on participants' physiological arousal was calculated for the total sample by testing the difference between mean SCL at T1 and T2, using a paired **t**-test. To explore the effect of clinician's communication, all data were plotted to explore the direction of the slopes of SCL before and after T3, using Microsoft Excel. The overall slopes during both parts of the consultation were assessed by calculating the mean SCL regression coefficients of all participants per second averaged over the time course (between T1 and T2, and between T3 and T4). A linear regression analysis was performed to compare the course of mean SCL between conditions in the time course T3–T4 (thereby including the interaction term between condition and time).

2.5.4. Recall

Recall was assessed as the percentage correct recall of provided information. To analyse the effect of clinician's communication, percentage correct recall of information provided before and information provided after the start of the manipulation was calculated. **T**-tests were used to assess differences in recall scores between both conditions. Welch's approximation was used in case of unequal variances.

2.5.5. Relation between SCL and recall

Linear regression analyses were performed to test if the variance in SCL could explain variance in percentage correct recall in both conditions, before and after T3.

3. RESULTS

3.1. Background characteristics

Participants' mean age was 41.6 years (**SD** = 14.7; median = 44.3; range = 19–64). Other background characteristics are summarised in Table 2. No significant differences were found between participants in the two conditions; therefore analyses were not controlled for background characteristics.

3.2. Manipulation check

Participants in the affective condition felt more reassured of medical support (**?**^{2}(4,**N** = 50) = 12.14, **p** = .02) and experienced more reassurance about non-abandonment by the clinician (**?**^{2}(4,**N** = 50) = 16.59, **p** = .002), as compared to the standard condition. Experienced empathy did not differ significantly between the conditions, although a trend was observed (**?**^{2}(3,**N** = 50) = 6.80, **p** = .08).

3.3. Skin conductance level

Participants' mean SCL during the video-watching procedure, is shown before (Fig. 1) and after (Fig. 2) T3. Fig. 1 shows differences in SCL between both conditions despite baseline correction and harmonisation, i.e. SCL was 0 in both conditions at the start of the video. This might be the result of substantial differences in SCL across individuals [50]. However, since we examined chances in SCL within conditions over time, this did not interfere with our analyses. Comparison of SCL on T1 (**M**(**SD**) = 1.10(0.03)) and T2 (**M**(**SD**) = 1.14(0.04)) revealed that SCL in the total sample significantly increased when the clinician broke the bad news; **t**(49) = 2.99, **p** = .004, $\mathbf{r}^2$ = .15. Exploration of slopes suggests that the overall decrease in SCL before the start of the manipulation (Fig. 1) was the same in both conditions (slope = -0.0003), but started to differ hereafter (Fig. 2). Exploration of slopes after the start of the manipulation suggests that SCL decreased more strongly in the affective communication condition (slope = -0.0004), compared to the standard communication condition (slope = -0.0002). The linear regression model used to assess these slopes confirmed a stronger decrease in SCL over time for the affective condition, as compared to the standard condition (**F**(3,554) = 579.12, **p** < .0001). The decrease in SCL could be explained by affective communication ($\mathbf{r}^2$ = .77; after: $\mathbf{r}^2$ = .87), whereas standard communication could explain variance to a lesser extent (before: $\mathbf{r}^2$ = .47; after: $\mathbf{r}^2$ = .41).

3.4. Recall

On average, participants recalled 62.2% of the information provided (Fig. 3). Total recall was significantly better in the affective condition (**M**(**SD**) = 66.3%(9.3)) than in the standard condition (**M**(**SD**) = 58.2%(14.8); **t**(48) = 2.31, **p** = .025, $\mathbf{r}^2$ = .10). Further analysis revealed that recall only differed between both conditions, for information provided during the part of the consultation in which clinician's communication differed, i.e. between T3 and T4.

Participants in the affective communication recalled 67.8% (**SD** = 2.5) of the information provided after T3, whereas participants in the standard condition recalled 58.3% (**SD** = 3.58) of this information (**t**(48) = 2.17, **p** = .035, $\mathbf{r}^2$ = .09).

3.5. Relation between SCL and recall

Variance in SCL did not significantly explain variance in percentage correct recall of information provided during the first part of the consultation, before clinicians' communication was manipulated (affective condition: **F**(1,23) = 0.09, **p** = .77, $\mathbf{r}^2$ = -.04; standard condition: **F**(1,23) = 0.14, **p** = .71, $\mathbf{r}^2$ = -.04), nor in the second part in the standard condition (**F**(1,23) = 0.47, **p** = .50, $\mathbf{r}^2$ = -.02). However, in the affective condition, after the start of the manipulation, SCL did affect recall. Regression analyses revealed that, in this condition, variance in SCL explained 21.1% of the variance in percentage correct recall of information provided after T3 in this condition (**F**(1,23) = 7.42, **p** = .01, $\mathbf{r}^2$ = .21).

4. DISCUSSION AND CONCLUSION

4.1. Discussion

This experimental study examined the effect of clinician's affective communication on APs' physiological arousal and information recall. As expected, breaking bad news evoked physiological arousal in APs. According to our expectations, subsequent affective clinical communication enhanced the decrease of APs' physiological arousal and improved APs' recall of provided information, in comparison to standard communication.

4.1.1. Physiological impact of the diagnosis of incurable cancer

Our results provide evidence that emotional arousal evoked by bad news is not limited to self-reported psychological arousal [6], [7] and [8], but also includes objectively measured physiological arousal. These findings illustrate the profound impact of an incurable cancer diagnosis and contribute to a better understanding of the acute stress response patients have to deal with in these consultations. Previous research already emphasised the connection between mental stress and increased physiological arousal across a variety of contexts and measurements, for instance cardiac autonomic reactivity and cortisol responses to social stressors in a laboratory [9], increased inflammatory markers in response to psychological distress [11], cortisol responses during care-giving [14] and cardiovascular reactivity to stressors in real-life [13]. However, to the best of our knowledge this is the first study demonstrating this connection in a bad news consultation.

4.1.2. Clinicians' affective communication decreased patients' physiological arousal

As bad news increases patients' physiological arousal, the literature suggests that clinicians might be able to decrease this distress via affective communication [31], which was also demonstrated by our results. Fogarty et al. already demonstrated the effect of short segments of empathy to decrease psychological arousal in clinical communication [6]. Our study further elaborates on this finding by showing that a few empathic remarks also have the power to affect physiological activity of APs' SNS. These insights might be valuable to clinicians. Firstly, activation of the SNS is known to influence patients' well-being [1]. Secondly, the effect of a core aspect of clinical communication, conveying medical information [52], can be severely hampered due to the effect of SNS activation on patients' memory [18].

4.1.3. Clinicians' affective communication also improved patients' information recall

As expected from prior research (e.g. [28]), affective communication did not only affect AP's physiological arousal, but also improved APs' recall of provided information, potentially partly by reducing physiological arousal. Notably, recall was only improved for information that was provided during the part of the consultation

where the clinician used affective communication and physiological arousal was lowered; 21% of the variance in recall could be explained by variance in physiological arousal. This might be an indication that patients' psychophysiological responses to clinicians' communication play a mediating role in the effectiveness of affective communication, more specifically in improving recall. Although we have not tested the connection between physiological arousal and recall directly, our results illustrate the often emphasised importance of addressing patients' emotions in clinical communication [52] and suggest that clinicians need to deal with patients' emotions before providing additional medical information to them.

4.1.4. Strengths and limitations of the study

The strength of this study is the use of an experimental design, which allowed us to investigate the causal effect of communication in a bad news consultation. Another strength is the measurement of physiological arousal [50], since it offered the opportunity to get a better understanding of the mechanisms underlying patients' cognitive and emotional processes during bad news consultations. Last, it allowed us to investigate the effects of specific communication elements more objectively and in different parts of the consultation [31] and [44].

The study also has some limitations. Although the **analogue patient paradigm** allowed us to use an experimental design, it might lowered the ecological validity of the results, as our results are based on findings from healthy participants, not clinical patients. Although a recent review study demonstrated that using APs do seem to be valid [41], clinical patients might react differently. However, in case of **real** bad news consultations, physiological responses might even be stronger and information recall further hampered, thus enhancing the potential alleviating role of affective communication. This has to be tested in clinical studies. Besides only verbal communication was manipulated in this study, although this increased internal validity it might decrease the ecological validity of our findings. The composition of the sample might also hold some limitations for this study, since only women who were interested in watching a bad news consultation applied for this study, which could lead to selection bias, and thus threaten the generalizability of our findings. Besides, the majority of our sample was highly educated and median age was lower than common for breast cancer diagnosis (which is 60 years [53]). Although breast cancer mostly affects women, what made it not very obvious to include male participants in our sample, it would be worthwhile to replicate this study with other types of health problems in a sample including also male participants, since gender effects are known to be present in clinical communication [48]. A final limitation is that we only assessed SCL as measure for physiological arousal. Although this is one of the most widely used response systems in psychophysiological research and provides a relative direct representation of activity of the SNS [15] and [50], it is generally recommended to apply a variety of physiological measures, to improve understanding of patients' physiological responses. For example, social interactions are known to influence heart rate and oxytocin levels as well [9], [13], [34] and [36].

4.1.5. Challenges for future research

Incorporating physiological data in doctor–patient communication research is a fairly new research area [44]. Physiological measures can complement self-report data and increase the understanding of ongoing processes in clinical communication and their relation to relevant outcomes for patient and clinician [44]. This study showed that it is a promising area, but there are still many problems to resolve. Firstly, individual differences in physiological responses are substantial [50] which makes it necessary to always relate physiological responses to the participants' own baseline level, which was done in our study. A more challenging problem is that physiological data can serve different emotions and are not always straightforward to interpret [15] and [44]. For example, a previous study in fibromyalgia patients concluded that affective communication could increase rather than decrease the skin conductance responses [54]. A possible explanation for these contradictory results is that in the fibromyalgia study, clinical communication was targeted at stimulating patients to talk about their problems, which might be emotionally challenging and increases physiological arousal [54], while in our study clinical communication was targeted at giving support and relaxation.
A more methodological, but equally challenging problem is the identification of irrelevant outliers amidst relevant physiological responses. Physiological activity might be attributable to body movement, coughing or other irrelevant events, but without feedback from participants it is difficult to distinguish these from sudden obtrusive thoughts or emotions that also could produce outliers in physiological responses. We have chosen not to exclude any participant from the analyses. In future research, it might be worthwhile to discuss physiological responses with the participant immediately after the experiment. In this way the participant can contribute to the interpretation of outstanding responses and the detection of outliers can be eased.

4.2. Conclusion

The emotional impact of a bad news consultation is not limited to self-reported psychological arousal, but is also recognisable in physiological arousal, even in analogue patients who are not personally confronted with a serious life-limiting diagnosis. However, clinicians can lower the evoked arousal by only a few words of empathy. This empathic communication increased analogue patients' recall of the provided medical information. Our results suggest that the decrease in physiological arousal might be partly responsible for this effect, although this should be confirmed in future research. More research is also needed to test the generalizability of these results to clinical patients.

4.3. Practice implications

The significance of addressing patients' emotions during clinical encounters [52] became clear in our study. Our results suggest that clinicians need to deal with patients' emotions before conveying additional medical information to them.

Irrespective of the content of the message, patients are often confronted with (psycho-)physiological reactions during clinical communication which interfere with their cognitive processing abilities. These insights are highly relevant for clinicians since recalling information is a prerequisite for patients to understand their disease, make informed decisions and future plans [3], [4], [25] and [26], and thus obtain true patient-centred care.

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CONFLICT OF INTEREST

None.

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TABLES AND FIGURES

Table 1.: Overview of the empathic remarks that were added to the script in the affective communication condition. These remarks were absent in the standard communication condition.

• "But whatever action we do take, and however that develops, we will continue to take good care of you. We will be with you all the way."
• "We will do and will continue to do our very best for you"
• "And whatever happens, we will never let you down. You are not facing this on your own."
• "I completely understand your reluctance. We'll look at this decision together carefully and we'll pay attention to your concerns."

Table 2. : Participants' background characteristics (N = 50).

Variable	**Condition**	
	Standard (*N* = 25) Frequency (%)	**Affective (*N* = 25) Frequency (%)**
Highest education		
Low (secondary school or less)	–	1 (4)
Medium (secondary school + vocational education)	10 (40)	4 (16)
High (higher vocational education or university)	15 (60)	20 (80)
Marital status		
Married (incl. registered partnership)	4 (16)	8 (32)
Never married	19 (76)	14 (56)
Other (divorced/widowed)	2 (8)	3 (12)
Occupation		
Studying	5 (20)	5 (20)
Paid Employment	9 (36)	10 (40)
Unemployed	6 (24)	7 (28)
Otherwise	5 (20)	3 (12)

Variable	**Condition**	
	Standard (*N* = 25) Frequency (%)	**Affective (*N* = 25) Frequency (%)**
Country of birth		
The Netherlands	25 (100)	24 (96)
Otherwise	–	1 (4)

N.B. No differences were found between participants' background characteristics (**p** > .05).

Fig. 1. : Participants' SCL before the start of the manipulation, displayed per condition. SCL is measured in microsiemens (µS) and harmonised so that displayed SCL was 0 at the start of the video. Relevant events in the consultation are indicated.

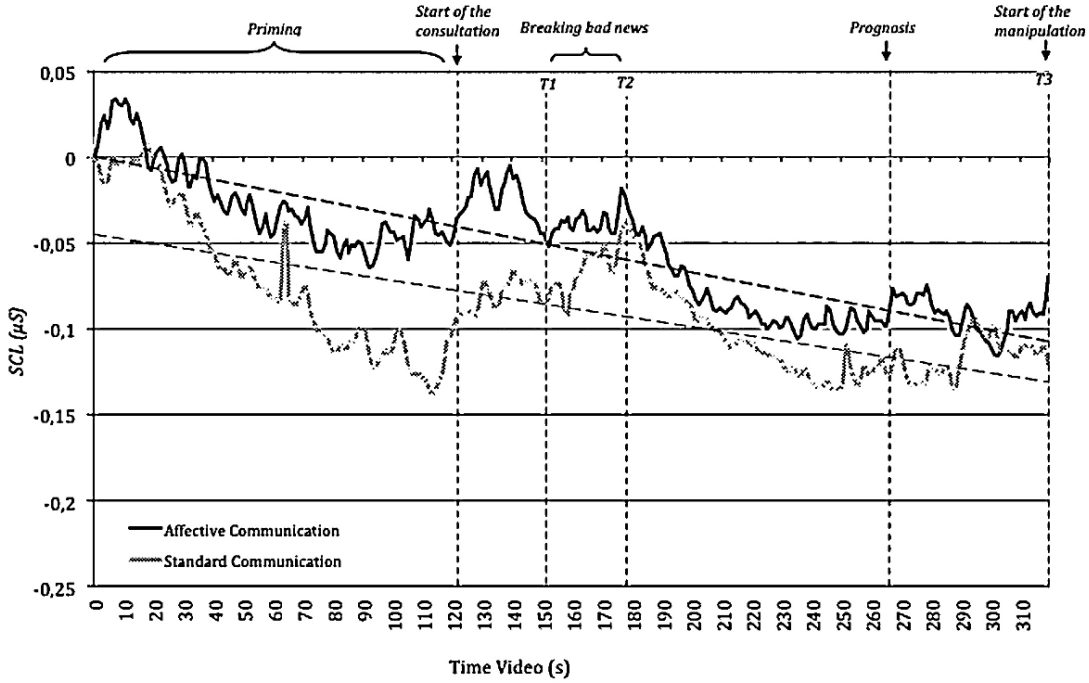

Fig. 2: Participants' SCL after the start of the manipulation, displayed per condition. SCL is measured in microsiemens (µS) and harmonised so that displayed SCL was 0 at the start of the video.

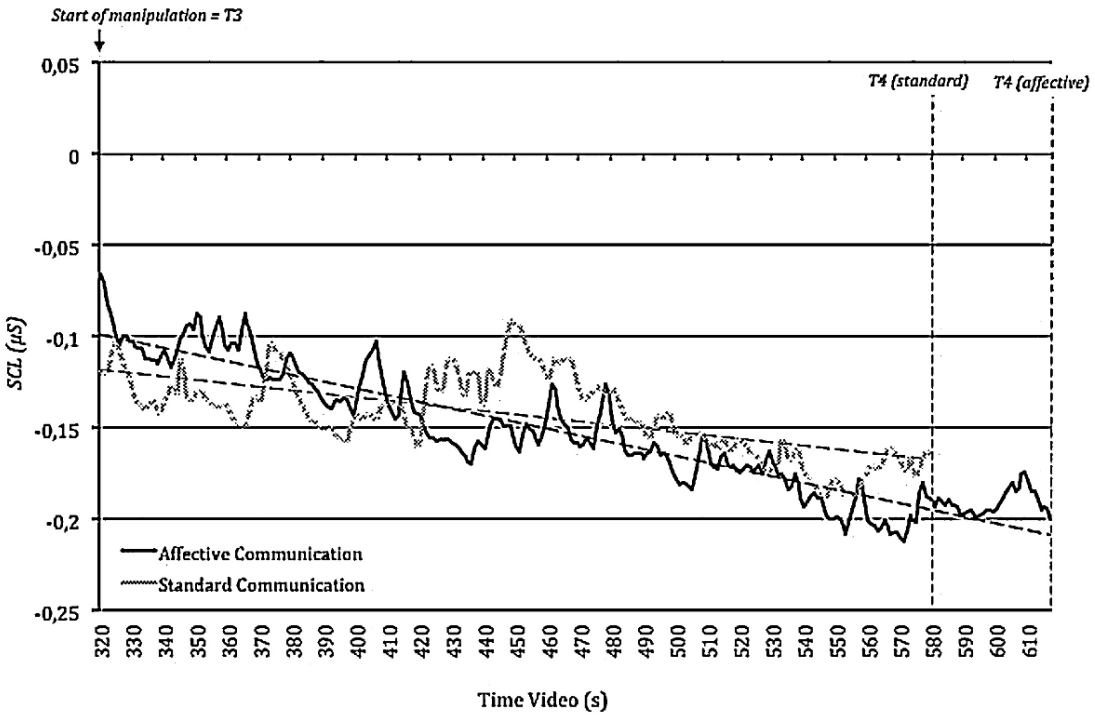

Fig. 3. Participants' percentage correct recall for provided information, before and after the manipulation. Error bars indicate one SD above and below the mean. *$p < .05$.