ВЗЕМАНЕ НА РЕШЕНИЯ В ДИГИТАЛНИЯ СВЯТ: ОТРАЗЯВА ЛИ СЕ ГЛЕДАНЕТО НА ВИДЕО ИЛИ ЧЕТЕНЕТО НА ТЕКСТ ВЪРХУ ПРЕЦИЗНОСТТА?

Ясен Янев, Даниела Андонова, Иван Александров

DECISION MAKING IN THE DIGITAL WORD: DOES WATCHING VIDEO OR READING TEXT AFFECT ACCURACY?

Yasen Yanev, Daniela Andonova, Ivan Aleksandrov

Abstract. The world of today is flooded with information which we need to process and make decisions. Does it matter if we perceive this information as text or video? Using video fragments of real-life diagnostic interviews and text representations with the same content we compared the diagnostic classification accuracy of experienced and novice clinical psychologists. Confidence was also examined. We noted lack of difference in accuracy between cases presented as video or text, and also, lack of difference between experienced and novice groups. What seemed to alter accuracy was the case itself, not its presentation (as text or video). Confidence was found to be positively correlated with accuracy. We conclude that text vignettes are as good case descriptions as videos.

Key words: Decision-making, Information perception, Diagnostic accuracy

Introduction

In the world of today, modern people are constantly flooded with large amounts of information – through computers, smart mobile devices, social media etc. However, the psychological phenomena involved in processing information and coming to a decision for action could not have changed much for a single generation, as the amount of information has. We are supposed to make sense of all this data that is constantly flashed before our senses, recognize the meaningful patterns and come to (often

quick) and accurate decisions. But, does it matter how this information is presented? What if it is presented as a text on a screen? Where a person can only perceive the information through the explanation provided and imagine the object in their mind. Or is it a video, where the object can be directly seen and perceived as it is? Also, does experience in dealing with this particular object matter? After years of experience in a certain area of knowledge, should the way in which professionals draw conclusions from their environment change in some way?

Pattern recognition and decision-making processes in a particular area of expertise differ from the way decisions are made outside this area, and also from the way that novice professionals make decisions (Kida, Moreno & Smith 2010). The general view is that novices proceed on the basis of deliberative thoughtful processes. Their decisions are guided by facts and strict frameworks, obtained by instruction and learning. Experts on the other hand are often able to quickly identify patterns from the environment and come to fast and accurate decisions (GlÖckner & Witteman 2010; Witteman & van den Bercken 2007). This latter type of process is referred to as *expert intuition* – it can be defined as rapid perception and holistic understanding of the situation, with lack of awareness of the processes involved (Chassy & Gobet 2011). But, does the expert intuition help experienced professionals to perceive the information from their surroundings in a different way, so they come to an accurate decision?

A key point in understanding the process of accumulating knowledge and gaining expertise in a particular domain is the relatedness to memory and the process of information retrieval. Some of the literature suggests that during the decision-making process, people recall the previously successful behavioural option (GlÖckner & Witteman 2010; Witteman & Tollenaar 2012). Moreover, according to Dougherty and colleagues' (1999) MINERVA-DM model, an intuition, in the sense of feelings toward an option, is an "echo" that results from automatically comparing the current object or situation (the *probe*) to all similar experiences of objects and situations stored in long-term memory. The direction and strength of an echo depend on the similarity between the probe and all traces stored in memory (Dougherty, Gettys & Ogden 1999).

In the domain of mental health and clinical practice a growing body of research shows that there is a rather obscure relationship between

clinical experience and expertise (Dawes 1994; Patel, Arocha & Zhang 2005). Unlike other fields, many years in clinical practice do not necessarily lead to better decisions (Ægisdóttir et al. 2006), particularly in the process of diagnostic decision-making (see e.g. Brailey, Vasterling & Franks 2001; Strasser & Gruber 2004). Some studies (Brammer 2002; Kim & Ahn 2002) suggest that more experienced psychologists are more competent in psychodiagnostic classification than novices, but the overall conclusion is that accuracy in diagnostic decisions does not seem to improve much with experience (Spengler et al. 2009). This is contradictory to the well-established notion that more experienced professionals make faster and more accurate decisions (Kida, Moreno & Smith 2010). So, how do many years of clinical experience influence diagnostic decision-making, if not by enhancing accuracy?

Many (e.g. Glöckner & Witteman 2010; Kida, Moreno & Smith 2010) suggest that expertise and expert intuition comes with experience, and results in an ability to quickly and accurately identify patterns in the environment, and come to a swift and accurate decision. Since experienced professionals generally do not outperform novices in a particular task (Witteman & van den Bercken 2007), one possibility is that the task itself does not allow experts to identify patterns in the environment, and come to a swift and accurate decision.

It might be that we are just not presenting the task in the right way. So far, research on clinical decision making worldwide, has generally been based on the DSM diagnostic criteria (American Psychiatric Association 2013). This results in diagnostic decision-making tasks that consists of symptoms, listed as a plain text on a computer screen, to be categorized into diagnoses. Our idea is that such tasks are not too similar to what experienced clinical psychologists have been dealing with in their years of practice. A more realistic representation might allow experts to see the pattern between the elements needed for an accurate diagnostic decision better than when described as text. It might even be that the representation that one forms when reading about a case is getting less specific with more experience, as there are more exemplars to be compared with that representation. An experienced psychologist will need a more complete, holistic representation of a person in order to trigger the right comparisons from long term memory and make an adequate judgment. Our idea was

to construct a task that comes one step closer to what experienced clinicians actually do in everyday practice – namely to observe the behaviour of a person. What would be the difference in accurate diagnostic decisions if clinical psychologists view a video recording of a Structured Clinical Interview for Disorders (SCID) versus read a text description of the same case?

We hypothesize that experienced clinicians will do better when they view a video of a person because it will be easier to get to the right comparison out of the large network of prototypes and exemplars they have stored in their long term memory. In the case of a text description, the image is subjectively created when a clinician reads about it which might leaves more room for erroneous diagnostic decisions.

The current study aims at testing an alternative method of measuring diagnostic accuracy. A text description of a case (i.e. vignette) asks an experienced clinician to create an image of a person with specific symptoms. We assume that more exemplars stored in participants' long term memory would make that image less precise. We hypothesize that presenting a case in a richer format (i.e. video) will allow experienced participants to better note the relevant features of a person's behaviour, therefore accuracy will be higher. If it was the case that experienced clinicians are better at deciding on the correct diagnosis when presented with a video of a patient than with a text description of the same case, we would expect a tendency for the correct answers of the experienced group to be more frequently found on the video tasks, as compared to the vignette tasks.

After each diagnostic decision, we asked participants about their confidence with the diagnostic decision they just made. Previous studies (e.g. Hall, Ariss & Todorov 2007) have found that higher confidence is associated with lower accuracy. Following Hall and colleagues' rational, we would expect confidence to be negatively correlated with accuracy.

Methods
Participants

Nineteen clinical psychologists (7 experienced and 12 novices) were tested. Being a novice clinician was classified as having less than 2 years of experience, and an experienced clinician was classified as having more than 10 years of experience, according to the "10 year rule" by Ericsson (e.g. Ericsson et al. 2007). Participants were recruited mainly by email,

but also by word-to-mouth. The sample of novice clinical psychologists consisted of Master students in Clinical psychology of Radboud University, who have finished, or still are in their practical internship. Ten euro reward for participation was offered to all participants.

Structured Clinical Interview for Diagnosis (SCID) Video Fragments and Text Vignettes

Recordings of Structured Clinical Interviews for Disorders (SCID) were purchased as DVDs from Columbia University, USA (see https://secure.cumc.columbia.edu/scid/). The strength of using the SCID videos is mainly that the diagnosis was made priori by at least three independent judges. Furthermore, the interviews are structured in nature, so the subjective influence of the interviewing clinician was kept to a minimum.

Four video fragments were included in the final design. An entire SCID interview is rather long – about 1 to 1.5 hours – so only the parts where the patients themselves were explaining their problems or difficulties (i.e. symptoms) they experienced were included. The used video fragments were between 4 and 5.5 minutes long.

The main idea here is to make a comparison between a video presentation of the necessary information for a diagnostic decision, and the standard text description (i.e. vignette) presentation. Therefore, two independent researchers transformed the video fragments into text vignettes. The amount and essence of the information was kept as identical as possible to the original video recordings. The length of the 4 vignettes presented to participants was no more than half a page each ($M = 206$ words). Each participant saw two vignettes and two videos. The order o tasks was counterbalanced across participants each had two vignette trials and two video trials. Participants' task was to choose the correct diagnosis out of the options listed below the question "What is the most likely diagnosis?". The six options ("Schizo-affective disorder", "Major Depressive Disorder", "Bipolar disorder, "Schizophrenia", "Psychosis", "Obsessive-Compulsive Disorder") were also presented in random order in each trial. Following each diagnostic decision we asked "How confident are you in this diagnosis?" with a 100 unit slider positioned at the 50th unit, ranging from 0 – "Not-so confident", to 100 – "Pretty confident". Participants were asked to grab and drag the slider to indicate their confidence.

Results

Experts vs. Novices

Given the small sample of 19 participants in total (12 novices and 7 experts) one has to be very cautious when interpreting the results, but they still give some initial insights about the use of vignette description of a case or a video recording of a case.

We expected that experienced clinicians will have higher accuracy on the video tasks, compared to the vignette tasks. Actually, experts had the exact same number correctly answered video and vignette cases. Novices had 1% more correct answers on the video tasks. Overall, novices were a little more accurate with 56.25% correct diagnostic decisions, whereas experts had 53.57% right.

Videos vs. Vignettes

Overall accuracy was 60.53%, for *videos* and *vignettes* it was 63.15%, and 57.89%, respectively. Our data showed no substantial differences on accuracy between the videos and the vignette trials. On the y axis of Figure 1 is the proportion of accurately made diagnostic decisions.
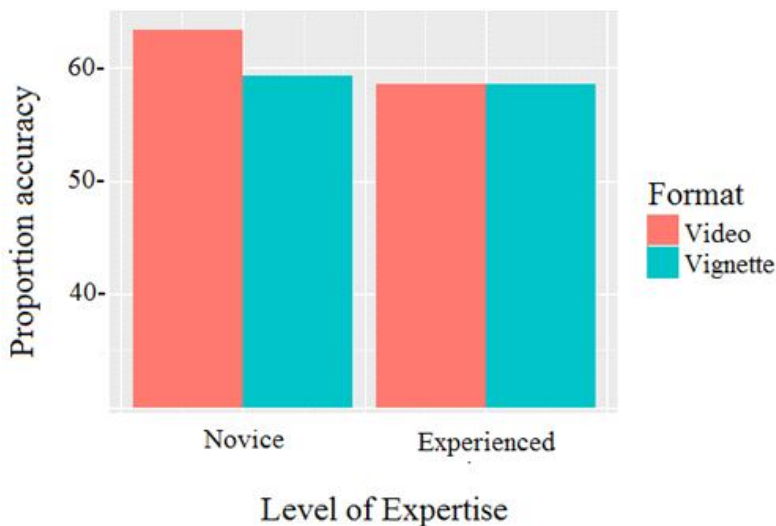

Fig. 1. Proportion of accurately judged diagnosis for *vignettes* and *videos*.

A comparison of the number of correct responses for each task, as a text vignette and as a video, is presented on Figure 2.

Fig. 2. Proportion of accurately judged diagnosis for each case presented as *vignette* or as *video*.

In Figure 2 we can see that the same pattern of accuracy levels per case appears regardless of whether the case was presented as text description or as a video fragment. We can also see that some cases were easier to answer correctly than others. Both the "easy" (the most correctly answered – "Super Mom") and the "difficult" (the least correctly answered – "Outer Space") cases were judged with approximately the same amount of accuracy by experienced and novice participants. Whether the case was presented as a vignette or as a video also did not make difference in terms of accurate diagnostic decisions.

Confidence

Novices and experts did not differ significantly in their levels of *confidence*. Generally, confidence levels did correlate with accurate diagnostic decisions. Bivariate correlation between accuracy and confidence was $r\,(76) = .357, p = .002$, confirming that generally, confident diagnostic decisions were also accurate ones. This is to some degree contradictory of previous findings (e.g. Hall, Ariss & Todorov, 2007) which had shown that confidence is associated with a drop in accuracy.

An interesting question is whether "Super Mom" and "Outer Space" (the "easy" and the "difficult cases", see fig. 5) had different levels of confidence. Indeed "Super Mom" had significant positive correlation between accuracy and confidence (r (76) = .380, p < .001), whereas "Outer Space" had a negative correlation with confidence (r (76) = -.291, p = .011).

Conclusions

These results do not support our assumption that presenting a video recording of a case will result in enhanced accuracy compared to a text description of the same case. Actually, according to our data, it makes no difference at all whether the case is viewed as a video or as text (Fig. 5). What seems to matter is the case itself. Regardless of whether the case was presented as text or video accuracy remained unchanged. Experience level also seemed to make no difference in the accuracy levels of easy and hard cases. This is good news for all the research done so far with the use of text descriptions of cases.

Interesting results were found using the *confidence* measure. It seems that generally clinicians are to some degree aware of their own understanding of the case as participants were more confident when they were accurate. Also, the case that had most correct answers had high positive correlation with *confidence*, whereas the most difficult case had negative correlation. There were also no differences between novices and experienced in terms of confidence. This is also an unexpected finding, as it would be plausible to assume that more experience would lead to more confidence in the diagnostic decision-making process.

Discussion

Current research has a few strong points, which add something to our knowledge about clinical diagnostic decision-making. Firstly, we replicated previous findings, that experts do not outperform novices on different diagnostic classification tasks. According to our data, presenting participants with a video recording of a case (i.e. SCID) or with a text description of a case (i.e. vignette) makes no difference in terms of accuracy or confidence. What seemed to matter is the case itself, and each case has its' own level of difficulty, regardless of how it was presented. Confidence with the diagnostic decision, however, seemed to correspond with the

difficulty of the case – participants were to some degree aware of their own understanding (or lack of understanding) of the case. They were confident in the cases where the correct diagnostic decision was "easy" and not confident when it was "hard".

The study is limited in the sense it was conducted online, which means that each participant completed the tasks either at their home or work place. Neither the surrounding environment nor participants' motivation could be controlled for. We had too small and unevenly distributed sample, which did not allow for meaningful between-group analyses to be carried out. Still, some conclusions could be drawn.

The study has implications for future research. It suggested an interesting relation between the difficulty of a case and the confidence of the diagnostic decision, which could be looked at in more detail. More research is needed in the area, as many aspects of the relationship between experience and expertise in mental health clinical practice remain unclear.

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