

Experience and Diagnostic Anchors in Referral Letters

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Abstract. The present study investigated whether diagnostic anchors, that is: diagnoses suggested in referral letters, influence judgments made by clinical psychologists with different levels of experience. Moderately experienced clinicians ($N = 98$) and very experienced clinicians ($n = 126$) were randomly assigned to reading a referral letter suggesting either depression or anxiety, or no referral letter. They then read a psychiatric report about a depressed patient, and gave a preliminary and final diagnosis. Results showed that the correctness of the diagnoses by very experienced clinicians was unaffected by the referral diagnosis. Moderately experienced clinicians did use the suggested diagnosis as anchor; when they had read a referral letter suggesting depressive complaints they were more inclined to classify the patient with a depressive disorder. In conclusion, the diagnosis in a referral letter influences the diagnostic decision made by moderately experienced clinicians.

Keywords: clinical decision making, experience, cognitive bias, anchoring, referral letter

Unfortunately, inaccurate diagnoses are relatively common in mental health practice (Brailey, Vasterling, & Franks, 2001; Fava, 2003). Diagnoses can be biased by, for example, patient characteristics (e.g., race, see Neighbors, Trierweiler, Ford, & Muroff, 2003; for an overview see Garb, 1998) or task characteristics (e.g., dynamic stimuli lacking predictability, see Shanteau, 1992; no or ambiguous feedback, see Vicente & Wang, 1998). Inaccurate diagnoses can also result from errors in information processing by the clinician (Garb, 1998). This can result in inadequate treatment plans, cost-ineffectiveness and medical-legal conflicts (Basco et al., 2000; Miller, 2002). It is therefore crucial to identify factors that influence psychodiagnostic classification, to be able to reduce the number of inaccurate diagnoses and their impact on clinical practice.

A diagnostic error might result from reading a referral letter, which is often the first source of information for a clinical psychologist. As there is considerable variability in both quantity and quality of the information presented in referral letters (e.g., Burbach & Harding, 1997), guidelines for the referral process have been suggested (cf. Struwig & Pretorius, 2009). These guidelines propose that a preliminary diagnosis is part of a good quality referral. However, this suggestion seems to ignore findings from literature on cognitive biases, which explains that initial values (i.e., diagnoses) can serve as an anchor. A preliminary diagnosis could bias subsequent processing since insufficient adjustments may be made (Tversky & Kahneman, 1974). This anchoring effect has been shown in many different domains and tasks (see Furnham & Boo, 2011).

Applied to the diagnostic process, according to Croskerry (2002) anchoring is

“the tendency to fixate on specific features of a presentation too early in the diagnostic process, and to base the likelihood of a particular event on information available at the outset” (p. 1187).

As the author explains, diagnostic decision makers fail to adjust their initial impressions (e.g., those derived from the referral letter) in light of later information, thereby bolstering the prematurely accepted first diagnosis. This could result in incorrect diagnoses if the anchor is incorrect. Anchoring is closely related to premature closure (i.e., the tendency to accept a diagnosis before it is fully verified) and confirmation bias (i.e., the tendency to look for confirming evidence to support a hypothesis, rather than look for disconfirming evidence to refute it) (Croskerry, 2002).

Anchoring was the topic of an early study by Friedlander and Stockman (1983), who asked experienced psychologists, psychiatrists, and social workers to read summaries of five therapy sessions and then asked them to rate the described clients' pathology and prognosis. Results showed that in a case of a moderately disturbed client, when pathognomic information was presented in the first session summary rather than in the summary of the fourth session, therapists rated the client as more maladjusted and having a worse prognosis. They found no such effect with a more

seriously disturbed client, possibly because the pathology and prognosis were clearly bad from the start. Interestingly, a subsequent study by Friedlander and Philips (1984), this time with an undergraduate sample, found no evidence of anchoring. Pfeiffer, Whelan, and Martin (2000) presented intermediately experienced therapists with a manipulated written referral letter from a physician, and concluded that their participants did not blindly adopt the diagnosis presented. The results seem mixed, and while some variation will be due to the different study designs, perhaps the clinicians' level of experience could also partly explain them.

The role of experience in clinical decision making in mental health has been studied for nearly four decades (see Spengler et al., 2009) and the conclusion seems to be that there is a small but reliable effect ($d = .15$), which favors experienced over less experienced clinicians when it comes to diagnostic accuracy. Proficiency does not develop linearly however, but rather follows a U-shaped pattern (Baylor, 2001; Brainerd, 2004; Patel, Arocha, & Zhang, 2005). "Intermediate" clinicians (with a moderate level of experience, i.e., between 2 and 10 years) tend to process information distinctively differently, and as a result perform differently. In some tasks they outperform their less and more experienced colleagues, for instance in recall of clinical case information (Schmidt & Boshuizen, 1993). However, due to the poor organization of their extending knowledge (Groves, O'Rourke, & Alexander, 2003), intermediates tend to perform worse when it comes to accuracy of psychodiagnostic classification (Wittman & Van den Bercken, 2007).

It seems plausible that clinicians with different levels of experience do not only differ in diagnostic accuracy but also in the extent to which they are prone to cognitive biases, since they may use different reasoning processes (Elstein & Schwartz, 2002). In fact, it is proposed that experience brings about a shift from more deliberate, logical, step-by-step processing to more automatic, intuitive processing (Hamm, 1988; Klein, 2003). In a dual-process model of cognition that distinguishes rational, thorough reasoning and intuitive, associative reasoning (cf. Evans & Over, 1996; Stanovich & West, 2000), intuitive processing is partially equated with heuristic processing. According to this model one would expect experienced clinicians to be more prone to cognitive biases such as insufficient adjustment from an anchor. In the medical decision making domain, anchoring effects have been investigated by among others Brewer, Chapman, Schwartz, and Bergus (2007). They found that family practice physicians' judgments were greatly affected by irrelevant anchors: Physicians who had been presented with a low anchor ("Is the chance greater or less than 1%?") judged the likelihood of a pulmonary embolism much lower than physicians who had been presented with a high anchor ("Is the chance greater or less than 90%?"). Others (Eva & Cunnington, 2006) found that with increasing experience, doctors showed an increased tendency to conclude in favor of their first impressions. Research outside the domain of clinical decision making also shows that experts show an anchoring effect (Furnham & Boo, 2011), although findings are diverse. For instance, some found similar anchoring effect sizes for student and

expert judges (Englich & Mussweiler, 2001), and others found that knowledgeable people are less influenced by an anchor (Wilson, Houston, Etling, & Brekke, 1996).

While there are some studies in the medical and other domains, to the best of our knowledge very few studies address the influence of anchors on the diagnoses of clinical psychologists with different levels of experience. We found only three, mostly older studies that address this topic (Friedlander & Philips, 1984; Friedlander & Stockman, 1983; Pfeiffer et al., 2000), and none that directly assess the correctness of decisions after referral suggestions demonstrated by intermediate and very experienced mental health professionals. The present study therefore aims to investigate the influence of experience of mental health clinicians on the correctness of their diagnoses after they have read a suggested anchor-diagnosis in a referral letter. We hypothesized that, in line with the results from Eva and Cunnington (2006) in the most closely related medical domain, very experienced clinicians would be more susceptible to be influenced by an anchor than clinicians with a lower level of experience, since experience leads to a shift from more analytical to more automatic and possibly bias-prone processing.

Materials and Methods

Participants

There were 215 participants, who had been recruited via an e-mail sent to four sections (General Hospitals, Elderly, Mental Health Care, and Addiction) of the Dutch Institute for Psychologists (NIP). Participation was voluntary, no monetary incentive was provided. Their average age was 43.62 ($SD = 12.05$), ranging from 25 to 78 years old. Participants, all licensed for clinical practice, were moderately to very experienced: All had their Master's degree in Psychology, 34 were doing a post-Master training as Mental Health Care Psychologist, 118 had already completed this training, 6 were in training to become a Clinical Psychologist or Psychotherapist, and 53 had already finished this training. Of the 215 participants, 52 participants were male (24%).

Participants were divided into experience groups, as is often done in comparable studies of experience effects in the clinical domain (e.g., Eva & Cunnington, 2006; Groves et al., 2003; Wittman & Van den Bercken, 2007). Although there are no hard criteria for delimiting experience groups, rule of thumb dictates that professionals with between two and ten years of experience are "intermediate," distinguishing them from novices with zero or one year of experience. "Very experienced" clinicians are professionals with more than ten years of experience (Ericsson, Krampe, & Tesch-Romer, 1993). Following this categorization, our sample consisted of 89 intermediate clinicians ($M_{\text{years of experience}} = 5.76$, $SD = 2.55$, range = 2–10) and 126 very experienced clinicians ($M_{\text{years of experience}} = 22.86$, $SD = 7.58$, range = 11–50).

Procedure

Participants received an e-mail with a direct link to an online questionnaire. By pressing the link, participants were redirected to the study website and randomly assigned to one of three experimental conditions, which differed in the content and presence of a referral letter. Participants in the “Anxiety” condition (A; $N = 72$ of which 29 were in the “intermediate” group) read a referral letter (incorrectly) suggesting anxiety- and tension-related complaints. Participants in the “Depression” condition (D; $N = 79$ of which 32 were in the “intermediate” group) received a referral letter (correctly) suggesting depressive complaints. Participants in the “Control” condition (C; $N = 64$ of which 28 in the “intermediate” group) did not receive a referral letter. Participants in the three conditions did not differ significantly in age, gender, or level of experience. Moreover, they were unaware of the different conditions and the condition they were assigned to.

Participants started by reading the instructions, explaining that they were about to read through a psychiatric report of a real patient. It was said that the report was divided into several blocks, and that after each block they had to give a diagnosis.¹ Diagnoses could be entered by the clinician in an open-ended response field, and no time restriction was imposed. After the instructions, participants filled in their demographic information (age, gender, education) and their years of working experience. Participants in conditions A and D then read the referral letter and afterwards were shown the first block of information. Participants in condition C were directly shown the first block. After reading this first block of information all participants provided their preliminary diagnosis. Then all participants read through the remaining six blocks of information and ended by writing down their final diagnosis. On average, the experiment was completed in 13 min ($SD = 5.43$).

Materials

The referral letter, written by a general practitioner (GP), stated: “The patient is referred to a crisis team because of depressive (Depression condition)/anxiety and tension related complaints (Anxiety condition) due to a reorganization at work. The patient was previously referred to an outpatient mental health clinic, but his condition worsened and the waiting list is too long.”

The psychiatric report used was based on a case history of a real patient, who had been treated for two years. Elaborate diagnostic research and treatment (including electroconvulsive therapy) confirmed the diagnosis of a depressive disorder. The case was divided into seven blocks of information (in total 1,303 words, 1–7 short paragraphs per block): general history, psychiatric history, medical history, medication use, biographical information, current

social context, and psychiatric research.² The psychiatric report and questionnaire were presented online, using ThesisTools. Participants were unable to go back after pressing forward, so previous diagnoses could not be changed after seeing subsequent information.

Data Analysis

Since an open-ended response field was used, both the preliminary and final diagnosis had to be categorized. Responses were categorized as matching the right diagnosis of depression (Depression) or not (Other).

Two hierarchical binary logistic regression analyses were performed, to predict the correctness of the preliminary and final diagnosis by condition and experience. As gender of the clinician was significantly related to the dependent variable “final diagnosis,” it was included in the model as a covariate. Gender and condition were entered at step 1; experience was added to the model as step 2. The final step consisted of all main effects and the interaction term of condition and experience. Since there were three conditions, first the Control condition was used as a reference category for the Depression and Anxiety condition, next the Anxiety condition was used as a reference category for the Depression and Control condition.

Results

In Table 1, the number and percentages of correct and incorrect diagnoses per condition are given for the two experience groups. Overall, 36% of the intermediates classified the patient correctly after reading the referral letter and the first block of information, 61.8% were correct after the final block of information. Of the very experienced clinicians, 32.5% classified the patient with a correct preliminary diagnosis, 52.4% was correct at the end.

Predicting the Correct Preliminary Diagnosis (Table 2)

Condition is a significant predictor of the preliminary diagnosis ($p = .02$), and this effect is only accounted for by the difference between the Anxiety and Depression condition ($p = .01$). Clinicians in the Depression condition are almost three times more likely to classify the patient with the right diagnosis than clinicians in the Anxiety condition ($OR = 2.74$). No significant differences were found between the Anxiety and the Control condition, or between the Depression and Control condition. There is no main effect of experience on the prediction of the preliminary

¹ The current study only reports the preliminary diagnosis made after the first block of information and the final diagnosis after reading all subsequent information.

² The case information used can be requested from the second author.

Table 1. Percentages of (in)correct diagnoses (preliminary and final) per condition and experience group

		Experience level	
		Intermediate (2–10)	Very experienced (11–50)
Preliminary diagnoses			
Anxiety referral	Correct	3 (10.3%)	14 (32.6%)
	Incorrect	26 (89.7%)	29 (67.4%)
Depression referral	Correct	20 (62.5%)	16 (34.0%)
	Incorrect	12 (37.5%)	31 (66.0%)
Control (no referral)	Correct	9 (32.1%)	11 (30.6%)
	Incorrect	19 (67.9%)	25 (69.4%)
Final diagnoses			
Anxiety referral	Correct	13 (44.8%)	26 (60.5%)
	Incorrect	16 (55.2%)	17 (39.5%)
Depression referral	Correct	25 (78.1%)	22 (46.8%)
	Incorrect	7 (21.9%)	25 (53.2%)
Control (no referral)	Correct	17 (60.7%)	18 (50.0%)
	Incorrect	11 (39.3%)	18 (50.0%)

diagnosis. The interaction effect of condition and experience is significant ($p = .01$), and this effect is again only accounted for by the difference between the Anxiety and Depression condition ($p = .002$). Very experienced clinicians are less likely ($OR = .08$) to be affected by condition (i.e., the referral letter suggesting either depressive- or anxiety-related complaints). See Figure 1 for a graphic representation of this interaction effect.

is only accounted for by the difference between the Anxiety and Depression condition ($p = .01$). Again, very experienced clinicians are less likely ($OR = .13$) to be affected by condition (i.e., the referral letter suggesting either depressive- or anxiety-related complaints). See Figure 1 for a graphic representation of this interaction effect.

Predicting the Correct Final Diagnosis (Table 3)

Condition does not significantly predict the final diagnosis, nor does experience. The interaction term of condition and experience is significant however ($p = .02$), and this effect

Discussion

This study investigated the influence of experience of clinical psychologists on the correctness of their diagnoses after having read a suggested diagnosis in a referral letter and subsequent case information. We hypothesized that very

Table 2. Summary of hierarchical binary logistic regression analysis for condition and experience predicting correctness of the preliminary diagnosis

		<i>B</i>	<i>SE</i>	Wald's χ^2	OR	95% CI	
						Lower	Upper
Step 1	Constant	−0.70	.28	6.18*	0.49		
	Gender ^a	−0.33	.35	0.88	0.72	0.36	1.44
	Ref. depression ^b	0.61	.35	2.95	1.83	0.92	3.66
	Ref. anxiety ^b	−0.40	.39	1.07	0.67	0.31	1.43
	Ref. depression ^c	1.01	.36	7.87**	2.74	1.35	5.53
Step 2	Constant	−0.66	.32	4.20*	0.52		
	Experience ^d	−0.10	.31	0.12	0.90	0.50	1.65
Step 3	Constant	−0.70	.41	2.92	0.50		
	Ref. Depression ^b × Experience ^d	−1.08	.73	2.20	0.34	0.08	1.41
	Ref. Anxiety ^b × Experience ^d	1.52	.88	2.98	4.57	0.81	25.61
	Ref. Depression ^c × Experience ^d	−2.59	.84	9.51**	0.08	0.01	0.39

Notes. OR = Odds Ratio; CI = Confidence Interval; Ref. = Referral letter. * $p < .05$, ** $p < .01$. Model 1: $\chi^2(3) = 4.57$, $p = .21$, $R^2 = .06$ (Nagelkerke). Model 2: $\chi^2(4) = 5.47$, $p = .24$, $R^2 = .06$ (Nagelkerke). Model 3: $\chi^2(6) = 13.92$, $p = .03$, $R^2 = .13$ (Nagelkerke).

^aReference category is female clinicians. ^bReference category is clinicians in the Ref. Control condition. ^cReference category is clinicians in the Ref. Anxiety condition. ^dReference category is clinicians with an intermediate level of experience.

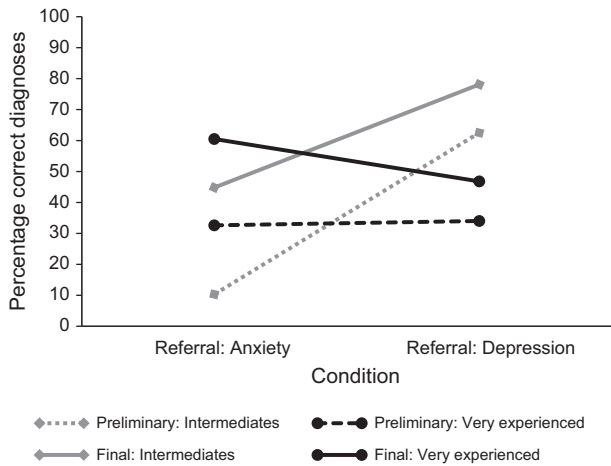


Figure 1. Percentage of correct preliminary and final diagnoses as a function of experimental condition and experience group.

experienced clinicians would be more susceptible to cognitive biases than clinicians with an intermediate level of experience, since experience may be expected to lead to a shift from more analytical to more heuristic, potentially error-prone processing. This should make very experienced clinicians more inclined to classify patients in accordance with the referral diagnosis than less experienced clinicians.

The results showed a significant interaction effect of referral and experience, but in a different direction than was expected. Very experienced clinicians seemed unaffected by the suggested diagnosis in the referral letter. Only clinicians with an intermediate level of experience seemed to be influenced by the anchor. Intermediately experienced

clinicians who had read a referral letter suggesting depressive complaints were more likely to correctly classify the patient with a depressive disorder, both directly after reading the referral letter and after having read all the information, than those who had read a referral letter suggesting anxiety complaints.

These findings seem to contradict results from Eva and Cunnington (2006), which indicate that very experienced clinicians are prone to be influenced by an anchor and less experienced clinicians are not, but not those of Wilson et al. (1996), who found that with more knowledge people show an anchoring effect less. Worth noting here is that Pfeiffer and colleagues (2000) state that plausible hypotheses elicit more conservatism (thus anchoring) than less plausible hypotheses. Possibly intermediately experienced clinicians in our sample, with their supposedly more poorly organized knowledge (Groves et al., 2003), thought of both suggested diagnoses as plausible but experienced clinicians did not. Then the finding that intermediate clinicians follow the suggestions more than experienced clinicians makes sense. Very experienced clinicians perhaps have learned from experience that referral diagnoses from GPs may be flawed, and thus think the referral letter may contain an implausible diagnosis and disregard this information (cf. Pfeiffer et al., 2000). Differences in results may also be due to the definitions of level of experience. For instance, the experienced clinicians in Friedlander and Stockman's study (1983) were on average ten years less experienced than our experienced participants, which means that perhaps their sample was more similar to our intermediate group than to our experienced group of clinicians. There might be an "intermediate-effect" for proneness to anchoring. Perhaps novices (undergraduates in Friedlander & Philips, 1984) and very experienced clinicians (our study) are unaffected by information presented early on in their decision making process, while moderately experienced clinicians, who are

Table 3. Summary of hierarchical binary logistic regression analysis for condition and experience predicting correctness of the final diagnosis

		B	SE	Wald's χ^2	OR	95% CI	
						Lower	Upper
Step 1	Constant	0.36	.27	1.82	1.44		
	Gender ^a	-0.65	.32	4.00*	0.52	0.28	0.99
	Ref. depression ^b	0.18	.34	0.29	1.20	0.61	2.36
	Ref. anxiety ^b	-0.05	.35	0.02	0.95	0.48	1.88
	Ref. depression ^c	0.23	.33	0.49	1.26	0.66	2.42
Step 2	Constant	0.50	.31	2.65	1.65		
	Experience ^d	-0.28	.29	0.90	0.76	0.43	1.34
Step 3	Constant	0.54	.39	1.88	1.72		
	Ref. Depression ^b × Experience ^d	-0.92	.73	1.58	0.40	0.10	1.68
	Ref. Anxiety ^b × Experience ^d	1.11	.71	2.42	3.02	0.75	12.17
	Ref. Depression ^c × Experience ^d	-2.03	.71	8.04**	0.13	0.03	0.54

Notes. OR = Odds Ratio; CI = Confidence Interval; Ref. = Referral letter. * $p < .05$, ** $p < .01$. Model 1: $\chi^2(3) = 4.57$, $p = .21$, $R^2 = .03$ (Nagelkerke). Model 2: $\chi^2(4) = 5.47$, $p = .24$, $R^2 = .03$ (Nagelkerke). Model 3: $\chi^2(6) = 13.92$, $p = .03$, $R^2 = .08$ (Nagelkerke).

^aReference category is female clinicians. ^bReference category is clinicians in the Ref. Control condition. ^cReference category is clinicians in the Ref. Anxiety condition. ^dReference category is clinicians with an intermediate level of experience.

still developing their case knowledge, are affected by the information they acquire early. Of course, this provisional conclusion should be re-examined using a large sample of clinicians with different levels of experience.

Important to note is that in our study experience was defined as number of years “on the job.” As several reviews show (e.g., Ericsson, 2006; Ericsson et al., 1993; Vicente & Wang, 1998), the level of experience a clinician has, is only weakly related to objective performance measures. Besides, age is confounded with years of working experience and it is thus difficult to distinguish experience effects from age effects. Furthermore, using a single case description involving only one disorder limits the generalizability of the results. Moreover, the diagnostic task was rather artificial and it thus remains uncertain to what extent our results reflect diagnostic decision making in daily practice.

Conclusions

Despite these limitations, our results seem to indicate that there might be an experience effect for proneness to anchoring to referral information: Referral diagnoses do seem to influence the correctness of the diagnoses of intermediate but not very experienced clinicians. On the bright side, this means that very experienced clinicians may be unaffected by information presented early on in their decision making process. On the down side, very experienced clinicians may not benefit from correct diagnostic referral information. Future studies could clarify whether and when intermediate clinicians outperform their novice and very experienced colleagues, and should include questions related to the decision process, and to assess which information the clinician has taken into account and the importance they assigned to it.

The present study indicates that the quality of referral information is important, certainly for clinicians with a moderate amount of experience. Referring physicians and clinicians should be aware of the influence that their preliminary diagnosis can have on the decision making process of the clinician who reads their referral. This information could be provided in guidelines of referral, and should include the notion that when uncertain about the diagnosis it is best to omit a diagnosis instead of giving a wrong “anchor.”

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