Decision Strategies for Mental Health Problems; a Comparative Judgement Analysis Study of General Practitioners and Mental Health Workers

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Introduction

The diagnosis of the mental health state of a patient varies substantially between general practitioners (GPs). Mean prevalence rates of psychiatric and psychological problems ranged from 9% to 39% in a British population1, and from 9% to 21% in a Dutch population2. It is not possible to rule out all variation between general practices, because part of the variation is due to differences in the populations of the general practices. However, part of the variation can be reduced by improving the process of diagnostic problem solving. In order to assess where improvements can be made, the process of problem solving needs to be characterized.

Information acquisition and information evaluation or weighing3 are two clearly distinguishable cognitive activities in diagnostic problem solving. In both stages variation between GPs can be generated. In the first stage, the information is gathered during the interview or prior to it. Information can be obtained from the patient, a relative or a friend, or from test results. An important factor at this stage is the (non)verbal interaction between GP and patient. The (non)verbal interaction can be influenced by socio-demographic characteristics of both parties, but also by the patient's clinical behaviour or the GP's attitude. Several studies1,4,5,6,7 have focused on these variables to explain the variety of diagnoses concerning mental health problems. At present, it is not possible to have a clear

Summary

In general practice, mental health problems are not always recognized and sometimes they are diagnosed incorrectly. This mismatch between the presented problem and the diagnosis may partially be explained by variation in diagnostic decision strategies. This study identified decision strategies based on paper patients (vignettes). The patients gave information on eight cues: somatic complaints and symptoms, depressive moods, feelings of anxiety, social problems, support from the social network, history of mental health problems, frequency of consulting the doctor, and patient motivation. Twenty-eight General Practitioners (GPs) were asked to reach conclusions about the patients' mental health and somatic condition. The results showed that two mental health strategies could be distinguished, which were labelled the 'exclusion' and 'inclusion' strategy, and that only one somatic strategy was revealed. It was expected that the wide range of mental health problems with which the GP is confronted would explain the variation in mental health strategies. Therefore, the strategies of the GPs were compared with those of 31 Mental Health Workers (MHWs). Although the MHWs see only a selected group of problems, they used more mental health strategies. Another interesting result was that the background information (social network, consulting frequency and motivation) was not used to diagnose the patients.

Key words: Diagnosis; Decision-making; Physicians family; Mental health

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Int. J. Health Sciences 1995, Vol. 6, no. 1, pp. 33-44
picture of the variables influencing the information gathering process. Many variables appear to have an effect, but the exact relationship between them is still under discussion.

Far less attention has been given to the weighting of the information gathered (the second stage). GPs rely on their medical knowledge and experience to weigh information. Some information will be used, while other information will not be used; some information will carry more weight than other information. The total pattern of weights given to the different units of information (cues) is called a decision strategy.

Even if physicians have gathered the same information about the patient, there can be diagnostic differences, because the information has a different impact on individual judgements. For example, two physicians may have the same information on the social network of a patient, but the first physician pays relatively more attention to this information than the second one. Both use the same information, but differ in their judgement regarding its weight for the diagnosis. This results in different decision strategies. These differences between GPs can help to explain why a patient will be diagnosed as having a (more serious) mental health problem by one physician and not by another.

This study centred on the weights assigned to the different cues (units of information) used in diagnosing a patient with mental health problems. A prominent method for capturing diagnostic decision strategies is called "Judgement Analysis". In a Judgement Analysis (JA) study the patients are usually paper patients or vignettes. The units of information given in these vignettes are the cues that enable the decision maker to arrive at a diagnosis. That is, although in real-life situations the diagnosis can be based on more information, the cues given are the most obvious ones for diagnosing a patient. Therefore, a first step in every JA study is to identify the most critical cues for a particular decision task. Another characteristic of most JA studies is that the vignettes do not resemble a normal case description. The description of the patient is presented by means of bar charts. Every cue is depicted by a bar chart and the height of the bar chart indicates the degree or the severity of the problem (in the next section an example will be given).

Although this method seems to be at first glance rather artificial, several valid and reliable JA studies have been carried out on the decision strategies applied in judging (diagnosing) the severity of a depression or the stage of rheumatoid arthritis. Special attention has been given to the criterion validity of this method in a study on rheumatoid arthritis. Real patients were judged on their state of rheumatoid arthritis. A researcher was present at the visits and recorded the important cues and their severity. Two weeks later the rheumatologist was asked to judge the same patients again, but this time the patients were presented by vignettes (bar charts). The judgements correlated very highly, \( r = 0.90 \), indicating that the criterion validity (internal validity) of the method is satisfactory.

The criterion validity shows that the same information given in different forms (patients and vignettes) leads to the same conclusions about the patient. Perhaps of more interest is the external validity of the method, i.e. are the extracted decision strategies generalizable to other populations, settings or levels of variables? Knowing the importance of this question, a separate study of the external validity has been carried out concerning the results of the JA study that will be described next. For that purpose, videotapes of GP consultations were translated into the terminology of the vignettes (the cues and their levels). From this information and the diagnoses made by the GP, the decision strategies were determined. The results of this video study suggested that it is possible to generalize the GP decision strategies from the vignette study to real life settings. This means that the following presentation of the results of the vignette study is of value in daily practice.

It is expected that the decision strategies based on the JA method will vary among GPs. Decision strategies can vary to the extent that each GP applies a highly individual strategy. However, it is also possible that several GPs use the same strategy, which differs from that of other groups of GPs. In that case, types of strategies (schools of thought) can be distinguished. Other reports have suggested that it might be possible to distinguish two groups of GPs that differ in their attitudes towards mental health problems. Based on the items of a questionnaire the GPs' approach was labelled as "clinical" or "general medical", i.e. the patient was regarded as a clinical object or as a person in their entirety. This difference in attitude might be reflected in a decision strategy.
The role of the GP in the Mental Health Care system can be described as that of a gatekeeper. This means that some patients will be treated by the GP, while others will be referred for more specialized assessment. The GP is confronted with a much broader range of mental health problems than the more specialized mental health workers (MHWs), who see only a selected group of mental health problems. It can be expected that the range of problems affects the variation in diagnoses. The smaller the range of problems the less variation in decision strategies\textsuperscript{14,13}. Therefore, a comparison was made between the decision strategies of GPs and MHWs.

The purpose of this study can be summarized as follows: (1) to acquire knowledge on the diagnostic decision strategies of the GPs for patients with mental health problems, (2) to qualify different types of decision strategies, and (3) to compare GPs and MHWs for differences in the variation in their strategies.

**Methods**

**Patients and the judgement task**

The patients were so-called vignettes. Each vignette gave information on eight cues. In an extensive interview with seven GPs and a pilot study\textsuperscript{19} these eight cues were identified as the most critical ones for diagnosing a mental health problem. Table 1 gives an overview. The description of the cues is based on the terminology used by the GPs in the interviews, except for the cues concerning depressive moods and feelings of anxiety. Their description was derived from the Hopkins Symptom Checklist\textsuperscript{20}. The items that correlated most highly with the DSM-III diagnosis\textsuperscript{21} of depression and anxiety\textsuperscript{22} were used to describe these two cues.

The eight cues were varied at five different levels (1 to 5). The vignettes were presented by bar charts. In this way the information about the patient was reproduced clearly and succinctly. Additionally (not in cues), the patient was introduced as 25 to 55 years old (without further specification), and it was mentioned that the duration of the clinical picture had lasted one month. Figure 1 shows an example of a vignette.

The vignette could be interpreted by means of a card. This card consisted of a description of the cues (see Table 1) and the various levels of these cues. The card had to be studied before the diagnoses were made and could be consulted at any time.

Based on each vignette the mental health state and the somatic condition of the patient had to be diagnosed. The diagnoses were made on a 9-point rating scale. That is, the degree to which the clinical picture was a mental health problem and the degree to which the clinical picture was a somatic condition had to be judged (0=none and 8=in extreme degree). By asking both judgements, insight could be obtained into the degree of inversion of the relation. A more inverse relation means that a decrease in the judgement (of the degree) of somatic problems is accompanied by an increase in the judgement (of the degree) of mental health problems and vice versa.

Fifty different vignettes were drafted randomly.

| 1. Specificity of somatic complaints and symptoms |
| Somatic complaints and symptoms such as stomachache, headache, musculoskeletal complaints, sleeping problems, tiredness, concentration problems, chest pain, abnormal heartbeat, etcetera, vary in their vagueness. That is, these complaints and symptoms can be explained by a demonstrable somatic disease in different degrees. |
| 2. Suffering from depressive moods |
| Depressive moods can be described as difficulty in falling asleep or staying asleep, feeling low in energy or slowed down, trembling, a feeling of being trapped or caught, feeling blue, suddenly scared for no reason, feeling fearful, and having thoughts of ending life. |
| 3. Suffering from feelings of anxiety |
| Symptoms of anxiety can be described as feeling fearful, suddenly scared for no reason, crying easily, worrying or stewing about things, nervousness or shakiness inside, headaches and feeling no interest in things. |
| 4. Suffering from social problems |
| Social problems are concrete problems about work, home, finance, family or friends. These problems can play a role now, in the past or become a threat to the future. |
| 5. Support from the social network |
| A social network can be described as the mutual relationships with family, friends, neighbours and acquaintances. The social network can support the patient. |
| 6. History indicating mental health problems |
| The history can be a family anamnesis, complaints about mental health, using psycho-pharmaceuticals or a referral to, for instance, a mental health institute. |
| 7. Frequency of attending the GP in the last year |
| 8. Patient’s motivation to change |
| The willingness of a patient to change or improve the clinical picture. |

Table 1. The description of the 8 critical cues.
### Procedure and participants

An appointment was arranged with the GPs and the MHWs (alone or in small groups) in which the booklet containing the vignettes was shown and the task was explained. The booklets had to be filled in within two weeks. Two GPs did not return the booklet, due to lack of time.

The participants were 28 GPs (6 women and 22 men) with a practice in Amsterdam. Some GPs worked alone (n=6), others in a team of GPs (n=8) or in a multidisciplinary team (n=4). These GPs were compared with 31 MHWs (19 women and 12 men), who worked in three different centres in Amsterdam. The MHWs had different professions, which could be grouped as follows: social workers/social psychiatric nurses (n=12), psychologists/psychotherapists (n=13), and psychiatrists (n=6).

### Analysis

The overall weight assigned to each cue on the different vignettes was computed for each participant by means of a multiple regression analysis with the cues in the vignettes as predictors and the two different diagnoses (mental and somatic health condition) as the dependent variables (one at a time). The β-weights from the multiple regression analysis represented the weights of the eight cues. A β-weight is higher if the cue is more used to diagnose the patients. A description of the weights of the eight cues depicted the decision strategy of an individual participant.

A cluster analysis was carried out to find out if the individual decision strategies could be formed into natural groups (schools of thought). A cluster was identified if at least five judges applied the same strategy. The strategy in a cluster was described by means of the average β-weights (*=100) of each of the eight cues. To analyse the significance of the differences between the cluster strategies a multiple analysis of variance was used with the individual β-weights of all eight cues as dependent variables and the clusters as independent variable. That is, if the weights given to the eight cues by individuals in one cluster differed significantly from the weights given to the eight cues by individuals in another cluster, the multiple analysis of variance showed a significant difference between the cluster strategies. To identify which cue(s) contributed most to the significant difference between the cluster strategies univariate analyses of variance were performed (individual β-weights per cue as the dependent variable and the clusters as the independent variable).

The data were considered stable (consistent and
reliable) if (a) the average (per cluster) correlation between the replicates \( r \) was satisfactory \( (r \geq 0.50) \); (b) the average multiple correlation \( R \) of the regression models was at least as large as the average correlation between the replicates\(^{15}\); and (c) the average squared multiple correlation \( R^2 \) of the regression models was meaningful (the explained variance being at least 50\%, \( R^2 \geq 0.50 \)).

**Findings**

First, the mental health strategies of the GPs will be described. Second, the somatic health strategies will be described. Third, the relation between the two judgements (mental health and somatic condition) of the patient will be examined for the GPs. Finally, the MHWs will be compared with the GPs on these three issues.

**A. General Practitioners**

**Mental health strategy**

The judgement analysis showed variation in mental health strategies among the GPs. Some GPs based their diagnoses on only one cue, the somatic complaints and symptoms, whereas other GPs used three to four cues, mostly a combination of the following ones: somatic complaints and symptoms, depressive moods, feelings of anxiety, and the social network.

Also, the weights given to the cues varied among the strategies. For example, some GPs based their diagnoses heavily on the cue “depressive moods” and somewhat on the cue “feelings of anxiety”, while others weighted these cues in reversed order.

The sign of the relation (positive or negative) between the cues and the diagnosis did not vary for the cues related highly to the diagnoses. That is, with increasing specificity of somatic complaints and symptoms the patients were less diagnosed as having mental health problems. With increasing depressive moods, feelings of anxiety, and social problems the patients were more diagnosed as having a mental health problem. The sign for the cues on the background information (social network, history of mental health problems, frequency of consulting the GP, and patient’s motivation to...
change), varied somewhat between the GPs. However, these cues were barely related to the diagnoses. Therefore, conclusions on the sign of the relation between these cues and the diagnoses cannot be drawn.

The decision strategies among the GPs could be clustered in two types. A MANOVA on the individual $\beta$-weights showed that the decision strategies between these types varied significantly, $F(8,19)= 6.76$, $P< 0.001$. Univariate analyses of variance showed significant differences between the $\beta$-weights for the following cues: "somatic complaints and symptoms", "depressive moods", and "feelings of anxiety". Figure 2 gives an overview of the weight (the importance) of the eight cues in the two types of strategies.

The data on which these results are based can be described as consistent and reliable within each strategy. The mean correlation between the replicates was $r= 0.65$ for both strategies. For the first strategy the mean explained variance was $R^2= 0.64$ and for the second strategy it was $R^2= 0.59$; the mean $R$ was in both cases larger than the $r$.

The two different strategies were labelled the "exclusion" and "inclusion" strategy. GPs with an exclusion strategy ($n= 13$) paid considerable attention to the information concerning the somatic complaints and symptoms and gave relatively little attention to the depressive moods and the feelings of anxiety. A very modest role was reserved for the information on the social problems. The background information (social network, history of mental health problems, frequency of consulting the GP, and patient’s motivation to change) played hardly any role in this strategy. In short, these GPs tried mainly to exclude somatic diseases.

GPs using an inclusion strategy ($n= 15$) based their diagnoses primarily on information concerning depressive moods, feelings of anxiety, somatic complaints and symptoms, and somewhat on social problems. The background information on the patient was hardly utilized in this strategy. These GPs included the psycho-social aspects of the patient and the somatic aspects.

It is of interest to note that the differences between the two strategies were not related to particular types of practice such as alone, in a team of practitioners, or in a multidisciplinary team, $F(16,30)= 1.51$, $P< 0.17$.

Somatic strategy

The data used to obtain the somatic strategy were stable (consistent and reliable). The mean correlation for the GPs' replicates was $r=0.71$. The mean explained variance was $R^2= 0.74$. The multiple correlation exceeded the correlation for replicates ($R > r$).

In contrast to the mental health strategies the GPs hardly varied in their strategy for the somatic diagnoses. They all gave the most weight to the information concerning the somatic complaints and symptoms. With increasing specificity of the somatic complaints and symptoms, the extremity of a somatic condition increased as well. Information concerning depressive moods, feelings of anxiety, and social problems contributed very little in reaching a somatic diagnosis. The background information hardly influenced the diagnoses on the somatic condition.

Relation between the two judgements

The correlation between the two judgements concerning the condition (mental and somatic health) of the patient was strongly negative for GPs with an exclusion strategy and moderately negative for GPs with an inclusion strategy ($r=-0.81$ and $r=-0.48$, respectively). Thus the relation was more inverse for GPs with a somatic focus than for GPs with the broader scope.

B. Mental Health Workers in comparison to the General Practitioners

Mental health strategy

The mental health strategies among MHWs varied considerably. Some MHWs used only one or two cues to diagnose the patients, while others used four to five cues. In general, the MHWs used more cues in diagnosing a patient than the GPs. This can mainly be ascribed to the usage of information on the history of mental health problems. Many MHWs related significantly their diagnoses of the mental state to the mental health history, i.e. with increasing history a patient was more diagnosed as having mental health problems.

Besides the amount of cues, the weight of the cues also varied among the MHWs. For example, some MHWs gave no weight at all to the information on the somatic complaints and symptoms, while others weighed this cue as the most important one.

Again the sign of the relation between the cue and the diagnoses was unequivocal for the highly
related cues, but somewhat ambiguous for the barely related cues. Overall, there was no difference between GPs and MHWs in the sign of the relation between the cues and the diagnoses.

A cluster analysis demonstrated three different types of strategies. A MANOVA with the individual β-weights as dependent variables showed that these strategies varied significantly from each other, F(16,42)= 5.59, P< 0.001. The differences can be attributed to six of the eight cues. The MHWs differed in the weights they assigned to the cues “somatic complaints and symptoms”, “depressive moods”, “feelings of anxiety”, “social problems”, “history of mental health problems”, and “patient’s motivation”, but not in the weights they assigned to the cues “support from the social network” and “frequency of visiting the GP”. Figure 3 gives an overview of the weight of the cues in the three mental health strategies used by the MHWs.

The data on which these analyses are based could be classified as moderately stable (consistent and reliable) for each strategy. The mean correlation between the replicates was r= 0.50, r= 0.32 (too low) and r= 0.57 for each strategy respectively. The mean explained variance was R²= 0.62, R²= 0.46, and R²= 0.54, respectively. The mean R was always larger than the r.

The three different strategies were labelled after the usage of the most important β-weights as the “restricted psychiatric” strategy (n=9), “general psychiatric” strategy (n=12) and “socio-psychiatric” strategy (n=10). In the restricted psychiatric strategy depressive moods played a prominent role with careful consideration given to feelings of anxiety and less attention to the history of mental health problems. Little attention was paid to somatic complaints and symptoms, social problems, support from the social network, frequency of attending the GP, and the patient’s motivation.

The general psychiatric strategy was characterized by an equal amount of attention being given to information concerning somatic complaints and symptoms, depressive moods, and history of mental health problems. Some use was made of infor-
mation concerning feelings of anxiety. Hardly any use was made of information such as: social problems, support from the social network, frequency of attending the GP, and the patient’s motivation.

The socio-psychiatric strategy concerning the mental health condition was based on the following elements: somatic complaints and symptoms, feelings of anxiety, to a somewhat lesser extent on the depressive moods and social problems, and to a very small degree the patient’s motivation. In this strategy support from the social network, history of mental health problems or the frequency of attending the GP were hardly utilized.

Note that the strategies did not differ per centre, \( F(16,42) = 0.90, P < 0.58 \). Surprisingly, the strategies were not related to the different professions among the MHWs, \( F(16,42) = 1.27, P < 0.27 \). There was a weak tendency that the social workers/social psychiatric nurses resembled the psychiatrists in their decision strategies, while the psychologists/psychotherapists differed in their strategies from both other professions.

A MANOVA with the \( \beta \)-weights as dependent variables revealed that the strategies of GPs differed significantly from the strategies of MHWs, \( F(8,50) = 5.85, P < 0.001 \). In fact, all five strategies concerning the mental health condition differed significantly from one another, \( F(32,175) = 5.51, P < 0.001 \). Table 2 gives an overview of the \( \beta \)-weights within each strategy and the differences between the \( \beta \)-weights for each cue. A weight can vary from -100 to 100. A weight of 40 and a weight of -40 was equal in importance to the diagnoses. A cue with a weight between -10 and 10 was hardly related to the diagnoses.

Since the differences between the five strategies were very large it is difficult to give a clear view. The weights can be discussed per cue for the five strategies. However, this diminishes the overview of the content of the strategies. Therefore, a short summary of the strategies will be given.

Table 2 shows that a GP using the exclusion strategy reached conclusions about the mental health state from information about the somatic complaints and symptoms (-60) and considerably less from cues as depressive moods (26), feelings of anxiety (17) and social problems (13). A GP using the inclusion strategy weighed the information concerning these four cues relatively more equally (-31, 47, 41, 19). Both strategies did not differ significantly in the use of the other cues (-5, 6, 9, 3 and -3, 8, 2, -2).

In the restricted psychiatric strategy the diagnosis of the condition of the mental health was strongly based on information concerning depressive moods (60), to a lesser extent on feelings of anxiety (43) and a history of mental health problems (20). When the general psychiatric strategy was used, the mental health condition was based equally on information about somatic symptoms and complaints (-32), depressive moods (35), and history of mental health (35), and to some extent on feelings of anxiety (18). Usage of the socio-psychiatric strategy meant that the mental health condition was based on information concerning somatic symptoms and complaints (-41), feelings of anxiety (32), depressive moods (42), social problems (31) – the first two were more heavily weighted than the latter – and to a minor extent on the patient’s motivation (11).

In general, the types of strategies among the GPs and among the MHWs differed significantly from one another. Background information did not determine the mental health condition, except for the history of mental health problems in the restricted psychiatric and the general psychiatric strategy of the MHWs. The implications of these results will be reviewed in the discussion.

Somatic strategy

Similar to the GPs, the MHWs hardly varied in their strategy for the somatic diagnoses. They too, gave the most weight to the information concerning the somatic complaints and symptoms and hardly any weight to the other cues. The calculations for the somatic strategy of the MHWs were based on stable data. The mean correlation for the MHWs for replicates was \( r = 0.59 \). The mean explained variance of the regression models was \( R^2 = 0.69 \). The multiple correlation exceeded the correlation for replicates (\( R > r \)).

However, a MANOVA on the \( \beta \)-weights revealed that the GPs differed significantly in their somatic strategy from the MHWs: \( F(8,50) = 2.98, P < 0.009 \). Univariate analysis of variance indicated that the GPs and MHWs assigned significantly different weights to the cue “frequency of attending the GP”: \( F(1,57) = 8.39, P < 0.006 \). This cue was assigned very little weight by both GPs and MHWs, -1 versus 5 (\( \beta \times 100 \)), and thus hardly related to the diagnoses. Therefore, it is concluded that there is
Table 2. The $\beta$-weights ($\times 100$) for the five different empirical strategies in determining the mental health condition

<table>
<thead>
<tr>
<th>Strategy:</th>
<th>General Practitioners</th>
<th>MENTAL HEALTH WORKERS</th>
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<tbody>
<tr>
<td></td>
<td>exclusion (n=13)</td>
<td>inclusion (n=15)</td>
</tr>
<tr>
<td>somatic cue $^a$</td>
<td>-60 $^a$</td>
<td>-31 $^b$</td>
</tr>
<tr>
<td>depressed</td>
<td>26 $^c$</td>
<td>47 $^b$</td>
</tr>
<tr>
<td>anxiety</td>
<td>17 $^b$</td>
<td>41 $^a$</td>
</tr>
<tr>
<td>problems</td>
<td>13 $^b$</td>
<td>19 $^a$</td>
</tr>
<tr>
<td>network</td>
<td>-5 $^a$</td>
<td>-3 $^a$</td>
</tr>
<tr>
<td>history</td>
<td>6 $^b$</td>
<td>8 $^b$</td>
</tr>
<tr>
<td>GP visits</td>
<td>8 $^a$</td>
<td>2 $^{ac}$</td>
</tr>
<tr>
<td>motivated</td>
<td>3 $^{ab}$</td>
<td>-2 $^b$</td>
</tr>
</tbody>
</table>

$^a$ Table 1 gives a complete description of the cues

$a,b,c$: Different indices from the same row are indicating significant differences at $P<0.05$

only one strategy for evaluating the somatic condition by both GPs and MHWs.

Relation between the two judgements

The correlation between mental health and somatic diagnoses for MHWs in the restricted psychiatric strategy was $r=-0.06$, in the general psychiatric strategy it was $r=-0.42$, and in the socio-psychiatric strategy it was $r=-0.50$. The low correlation in the restricted psychiatric strategy suggested that the judgement of the mental health condition was not related to the judgement of the somatic condition. The correlation in the other two strategies reflected that the relation between mental health and somatic conditions was moderately inverse.

Discussion

This study raised three issues: (a) diagnostic decision strategies of GPs, (b) types of diagnostic decision strategies (schools of thought), and (c) the variation in strategies among GPs compared to MHWs. The findings will be summarized and discussed below with respect to similar reports and their generalizability to other medical diagnoses.

The mental health strategies among GPs varied but two types of strategies could be distinguished, namely the exclusion and inclusion strategy. In the introduction a distinction based on other reports $^5,^{18}$ was made between two groups of GPs' attitudes, namely "clinical" and "general medical". The clinical view represented a patient as a clinical object, while the general medical view illustrated a broader view on the patient. The content of the exclusion versus inclusion strategy has a striking resemblance to the contrast between the attitudes. It would be worthwhile to examine the relation between the attitude of the GP and his/her evaluation of the available information.

A divergence between GPs and MHWs in mental health strategies was expected, because it was thought that MHWs were confronted with a narrower range of mental health problems than GPs. With a decreasing range of problems the variation in strategies was expected to decrease as well. However, MHWs showed not less but more variation in their decision strategies than GPs (three compared to two types of decision strategies). This means that the variation in GPs' strategies cannot be explained by the large range of mental health problems in general practice. Prudence is in order here. The MHWs and the GPs based their diagnoses on the same vignettes to make the comparison as pure as possible. Perhaps the higher variation in strategies among MHWs is due to the fact that the patients diagnosed had more resemblance with patients in a general practice than in a mental health service centre. To diagnose extraordinary patients makes the task more difficult for the MHWs. Task complexity is a prominent predictor of variation in outcomes$^{23}$.

Regarding the somatic condition, it was found that both GPs and MHWs employed the same decision strategy. The information on the somatic com-
plaints and symptoms was of overriding importance in the diagnosis. This result was expected, because the somatic problems were rather generally expressed; a straightforward relation to the diagnosis was bound to happen. If more cues on the somatic condition of the patients were given in the vignettes more differences would probably have emerged in the somatic strategies of the GPs and the MHWs. Nonetheless, it is worth noting that the mental health strategies were unrelated to the somatic decision strategies. However, this conclusion must be weakened to some extent. Although the correlation between the two judgements (mental health and somatic condition) was (very) modestly negative, an exception must be made for the GPs using an inclusion strategy. In the inclusion strategy patients were diagnosed as someone with a somatic problem or a mental health problem, while in the other strategies patients were diagnosed as someone with a somatic problem and a mental health problem. This suggests that the GPs with an inclusion strategy applied a disjunctive strategy and the others applied a conjunctive strategy.

A surprising result of the study was that the background information concerning social support, frequency of consultation, and motivation of the patient hardly influenced the diagnoses. Other reports have submitted that life events and social support are important cues for treatment. The frequency of consultation has been suggested as an index of some somatoform disorders. Low motivation has been thought of as an important index of depression and high motivation to be associated with patient compliance. It is of interest to know that these dimensions, which have obvious impact in real life, were not used in the judgement situation. The background information on the history of mental health played a peculiar role. It was unimportant for the GPs, but it was important in two of the three MHWs’ strategies for mental health problems. This could be a reflection of the difference in patients attending the GP and MHW. Perhaps, it is for MHWs more important than for GPs to have knowledge of the patients’ mental history in order to be able to diagnose the patient. However, overall the actual problems and complaints received relatively more weight than the background information.

It should be noticed that the given information (eight cues) is in daily practice not the only information on which a diagnosis is based. In the introduction it is maintained that information acquisition and information evaluation are two cognitive activities in the process of diagnostic problem solving. The presented study examined exclusively the activity of information evaluation. This means that for instance the idiom of the patient (phrasing the problems in somatic or psycho-social terms) could not influence the diagnosis. Other studies have shown the importance of this factor to the diagnosis of the physician. It is, however, remarkable that even in a stripped off situation the variation among GPs is clearly present.

The generalizability of the present findings to other medical diagnoses is an issue that has not been brought up yet. Variation in use of information is also common in other diagnoses. In a study with stooge patients, the agreement among 23 GPs concerning myocardial infarction symptoms was as follows: no symptoms were named by all the 23 GPs, there was more than 80% agreement about only 3 in a total of 283 symptoms, and the agreement about the other symptoms was less than 50%. Similar data were found for bronchitis, hyperthyroidism and hypochromic anaemia. The modest agreement among usage of information on mental health problems in the current study is not exceptional.

Another source of variation in diagnoses not mentioned yet is that the variation in the usage of information not only differs between doctors, but also within doctors. It is possible that the same patient will be diagnosed differently at two different times. Likely the more difficult the judgemental task, the more variation in judgements even within persons. This is exactly why the expectations about the mean correlation between replicates was modest in this study.

It may be concluded that the decision strategies gave insight into the variation in the weights assigned to the different cues. An important next step would be to learn about the advantages and disadvantages of the different strategies. This would provide an objective means to evaluate the pros and cons of each. Based on this information a group of professionals could try to reach agreement about the essential cues and the weights of these cues. This discussion can contribute in the development of systematic diagnostic protocols for mental health problems that could reduce the variation in diagnoses. At present the multi-track diagnostic
approach is recommended in Dutch medical science for general practice29. That is, the GP should consider simultaneously the organic, psychological and social aspects of the complaints and symptoms of the patient. However, the weighting of these different facets is not yet problematized.

Although, the emphasis in this study was on the GP strategies, the results suggest that it probably would be very useful to develop a protocol for the MHWs as well. If the protocols are developed, they should be taking part of the training programs during the (post) academic education, because training decreases the potential variation30. Moreover, if a clear protocol can be generated, the variance due to the information gathering process, will probably become less as well. After all when it is obvious what kind of information must be evaluated the process of gathering becomes more structured.

Acknowledgements

We gratefully acknowledge the help of the 28 GPs and 31 MHWs who collaborated with us in this research. The study was supported by a grant from the Dutch Prevention Foundation (Praeventiefonds) which was awarded to the Departments of Clinical Psychology and Psychiatry, University of Amsterdam. The project was executed at the Municipal Health Service (GG & GD), Amsterdam.

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received: 03-08-1994
revision asked by the editor: 16-12-1994
accepted: 07-06-1995