The Verifiability Approach to Detect Malingering of Physical Symptoms

I. Boskovic, Glynis Bogaard, Harald Merckelbach, Aldert Vrij & Lorraine Hope

Abstract

Inspired by recent research showing that liars are reluctant to include details they think are verifiable in their accounts, we explored in two studies (N = 125; N = 105) whether participants who report fabricated symptoms of ill-health ('malingerers') present fewer verifiable details than participants who report genuine ill-health symptoms. In Study 1, participants were instructed to describe a typical day on which they had experienced a genuine or malingered symptom of ill-health. Truth tellers' statements included significantly higher proportions of verifiable details concerning the reported symptoms than malingerers' statements. Compared with truth tellers, malingerers generated longer statements with more unverifiable details. In Study 2, we informed participants that their statements may be assessed for verifiable or checkable details. Malingerers referred interviewers to 'false' witnesses to provide checkable information and differences between malingerers and truth tellers in statement length, and checkable and uncheckable details were no longer significant. The utility and implications of the verifiability approach to detection of malingering for physical symptoms are discussed.

Keywords: The Verifiability Approach, malingering, detection of deception, physical symptoms, symptoms report.

The Verifiability Approach to Detect Malingering of Physical Symptoms

Fabrication of physical symptoms in a medico-legal context burdens the health care system and ultimately may harm the care that genuine patients deserve (Bianchini, Greve, & Glynn, 2005). Thus, it is important to develop tools and strategies that can help in identifying people who fabricate ('malinger') symptoms of ill health. Malingering is defined as the intentional production of false or grossly exaggerated symptoms motivated by external incentives. The incentives may consist of financial rewards gained through personal injury litigation or workers's compensation procedures (McDermott & Feldman, 2007), or reduced legal responsibility (American Psychiatric Association, 2000, p. 739). It is difficult to determine on what scale malingering occurs, because 'successful' malingerers remain undetected (Resnick, West, & Payne, 2008). However, a conservative estimate is that, for example, 20% of chronic pain patients exaggerate their symptoms (Greve, Ord, Bianchini, & Curtis, 2009), while in cases of mild head injury and chronic fatigue prevalence rates of malingering are an estimated 35% (Mittenberg, Patton, Canyock, & Condit, 2002).

The most frequently used methods for the detection of malingering involve examining intentional underperformance on simple memory tasks (e.g., Iverson & Binder, 2000) or examining over-reporting of physical or psychological symptoms (Merten, Merckelbach, Giger, & Stevens, 2016). Such tests are called Symptom Validity Tests (SVTs) and have shown to be useful in a forensic setting (see Sleep, Petty, & Wygant, 2015; Bianchini, Mathias, & Greve, 2001), but less so in a medical setting (Schoenberg, Dorr, & Morgan, 2003; Roger, Sewell, & Salekin, 1994).

In general, somatic symptoms such as pain have been scarcely investigated in malingering research. Pain is a reliable concomitant of many physical symptoms, but research so far has failed to design specific methods to detect malingering of pain (Greve, Bianchini, & Brewer, 2013; Fishbain, Cutler, Rosomoff, & Rosomoff, 1999). One difficulty in detecting

fabrication of physical symptoms such as pain is that genuine symptoms do fluctuate over time in intensity and durability (Fishbain et al., 1999). Malingers can therefore report about their genuine 'bad' moments from the past, as if they are still ongoing. Another difficulty is that it is impossible to quantify pain with methods that are independent of patients' self-reports (McDermott & Feldman, 2007). Finally, almost everyone is familiar with pain as a symptom and therefore most malingerers are likely to know what kind of sensations should be reported to appear convincing, which impedes the detection of malingering in this domain (Hamilton & Feldman, 2001).

Given these considerations, there is a need for novel malingering detection methods that will not just focus on memory functioning and/or psychopathology, but on the verbal details of patients' symptoms report. One recent study that addressed this issue in a systematic fashion is that of Akehurst, Easton, Fuller, Drane, Kuzmin, and Litchfield, (2015). These researchers employed a combination of criteria of different verbal lie detection methods, such as Criteria Based Content Analysis (CBCA; see Blandon-Gitlin, Pezdek, Lindsay, & Hagen, 2009; Steller & Kohnken, 1989) and Reality Monitoring (RM; Johnson & Raye, 1981; see Bogaard, Meijer, Vrij, Broers, & Merckelbach, 2013) to identify exaggerated symptoms after exposure to an experimental stressor. Generally, evaluators who used these methods were better in discriminating between truth tellers and malingerers than evaluators who did not use these methods. However, the mere quantity of details in symptoms reports could not serve as robust indicators of veracity (Akehurst et al., 2015). This suggests that the richness in details in symptoms report, the main idea behind CBCA method, is not diagnostic of honesty.

One potentially promising avenue is a newly devised verbal lie detection method: The Verifiability Approach (Nahari, Vrij, & Fisher, 2012). The Verifiability Approach is based on two aspects of deceptive strategies. First, liars tend to provide statements that are rich in details, because they want to make a convincing impression and believe that detailed stories

sound convincing. Second, liars tend to avoid mentioning details that could be checked by investigators.As a solution to these conflicting strategies, liars, compared with truth tellers, typically provide fewer details that can be verified and more details that cannot be verified (Nahari, Vrij, & Fisher, 2014a, b; Nahari & Vrij, 2014).

Several Verifiabily Approach studies (Harvey, Vrij, Nahari, & Ludwig, 2016; Nahari et al., 2014b; Vrij et al., 2016) have examined the effect of informing participants, using an 'Information Protocol', that the details of their statements could be subsequently checked by the interviewer. Across studies, this warning has resulted in an increased number of verifiable details being reported by truth tellers but not by liars, strengthening the efficiency of the Verifiability Approach. This warning, as part of the Verifiabilty Approach, has also facilitated discrimination between truths and lies in insurance claims settings (Harvey et al., 2016; Vrij et al., 2016). Most likely these instructions motivated truth tellers to search their memory for additional verifable details - something that is not possible for liars to do.

The Verifiability Approach is a promising lie detection approach, but has not been applied in the context of malingering physical symptoms to date. Actually, research to date suggests that the efficacy of the Verifiablity Approach depends on the context in which it is used (Vrij, Nahari, Isitt, & Leal, 2016; Nahari et al., 2014). For example, in mock crimes scenarios, where an interviewer knows all the details of the 'crime', liars have difficulty in providing verifiable details. This is probably because liars are unable to demonstrate they were at a different location than the crime scene during the time the crime occurred. In contrast, in insurance claim cases, someone could falsely claim to have lost his phone while running, but could then truthfully describe his run. Therefore, liars determine themselves when an object is stolen or lost, which provides liars with more degrees of freedom to generate false verifiable details (Vrij et al., 2016; Nahari et al., 2014). This might also explain why the Verifiability Approach was not an effective strategy for discriminating between true

and false insurance claims (Nahari, Leal, Vrij, Warmelink, & Vernham, 2014). In case of malingering, the same problems might apply, such as the absence of the ground truth and the option to tell lies incorporated with previous truthfull experience of a specific symptom.

Therefore, our two studies are a first attempt to explore the usefulness of this approach to the detection of malingering. We asked participants to write a statement reporting real or fabricated common physical symptoms, such as a headache or stomach ache (Petrie, Faasse, Crichton, & Grey, 2014). In the first study, participants were given the task to write a symptom report, while in the second study, they were informed that their statements may be checked by a medical professional. We predicted that in both studies, truth tellers would provide significantly more verifiable details about their symptoms than malingerers, whereas malingerers would include more non-verifiable details in their statements than truth tellers (Hypothesis 1). We also predicted that the proportion of verifiable details (verifiable details / total details) would be higher for truth tellers than for malingerers (Hypothesis 2).

Study 1

Method

Participants

We conducted an online study that included 125 undergraduate psychology students. Participants were 17 - 38 years of age, with an average age of 20 years (*SD* = 2.48). The majority were women (86%).

From the total number of participants, 41 reported having real physical symptoms of different medical conditions (see Procedure), whereas 84 did not report any symptoms of physical ill-health. On the basis of these initial symptom reports, participants were allocated into two groups: truth tellers (with real symptoms) and malingerers (without symptoms).

Procedure

After participants signed up for the study, they were directed to an online link to start the survey in Qualtrics. After answering demographic questions, participants were asked to report any physical symptoms of ill-health they were experiencing ('Do you currently or did you in the last week suffer from any physical symptoms, such as a headache, stomachache, fatigue etc.?'). Participants who answered in the affirmative were considered as 'truth tellers', whereas participants who responded negatively to the question were next instructed to malinger.

We presented the participants of both groups with 10 of the most frequent physical symptoms of ill-health reported in the general population (Petrie et al., 2014). Participants also could add additional symptoms if the illness they were experiencing was not on the list (no new symptoms were added). Malingerers were instructed to select one of the listed symptoms and to write a statement about the target symptom as though they suffered from it. They were presented with the following instructions: 'Imagine that you suffer from this specific symptom and try to imagine all the details of experiencing that symptom of ill-health. Consider that you did not attend your exam because of this symptom. Imagine we are the exam committee asking you to provide us with specific details of the day on which you experienced the symptom. Give us a description of your behavior during the day you 'had the symptom'. Your report should start with the morning in which you noticed the symptom and then proceed through the next hours until you went to bed.' Truth tellers received a similar instruction, except that they were asked to give a chronological account of the last day they suffered from their symptom of ill-health. Both groups wrote reports about their symptoms. No length nor time limitations were imposed. Table 1 shows the frequencies of selected symptoms for truth tellers and malingerers.

After truth tellers and malingerers had written their statements, we asked them to evaluate the difficulty of this task on 7-point Likert scale (1 = very easy; 7= very difficult). They were then thanked for participation and rewarded with one research credit.

-Insert table 1 about here-

Coding

All statements were coded by one coder, and the second coder scored a randomly selected 20% of all statements. Both coders were blind to the veracity of the statements. We coded for the presence of the following details, all derived from the Reality Monitoring literature (Johnson & Raye, 1981): Perceptual (i.e., information about what a person has seen, smelt, heard or felt); Spatial (i.e., information about spatial arrangement of objects or people); Temporal (i.e., information about the time when a behavior/action happened, an event happened or a sequence of events/behaviors happened), and descriptive (i.e., specific description of action, objects or symptoms) details. Every word describing a symptom ('headache', 'stomachache', 'pain', 'fatigue'), emotional feeling ('I feel', 'anxiety', 'scared'), internal experience or state ('worried', 'decided', 'I wished/wanted', 'thirsty', 'tired'), or information about what a person saw, heared or tasted ('I saw red dots', 'noise', 'bitter'), was coded as a *perceptual* detail. *Spatial* codes included every detail about where an event happened ('at home', 'in the streets', 'at car'), or about spatial arrangements of people or objects ('upstairs/ downstairs', 'down', 'up', 'in front'). *Temporal* details included information about the time in general ('at noon', 'midnight', 'day'), or about a specific time ('at 13h'), or time sequences of the events ('before', 'after', 'during', 'the next day', 'previously').

We also coded descriptions of actions and objects. Every description of an action ('took an Aspirin 500mg', 'called a doctor', 'talked to my friend'), symptom ('strong', 'sharp', 'coming in waves'), or object ('shiny') was coded as *descriptive* detail.

Following Nahari and Vrij (2014), all details were coded either as *verifiable* or *non-verifiable*. For a detail to be coded as verifiable, it had to meet one of the following criteria. The activities 1) were documented (appointment with a doctor, prescriptions, receipt etc.) and, therefore, potentially checkable; 2) involved an action carried out together with (an) other identified person(s) rather than alone or with a stranger who could not easily be traced; 3) pertained to something that was witnessed by (an) other identified person(s); 4) were reported as being recorded (e.g. on CCTV) by the interviewee; 5) used technology (use of cash machine, bank cards, phone, tablet, computer); or 6) could potentially be checked by blood analysis and medical tests (taking specific pills).

To examine the inter-rater reliabilities between coders intraclass correlation coefficients (ICC) were calculated. They were excellent for verifiable (ICC = .98) and non-verifiable details (ICC = .94), as well as for the total sum of details (ICC = .94). Regarding the separate categories of detail, except for spatial details (ICC = .63), the majority of ICC's indicated almost perfect agreement (all ICC's > .84; see supplemental Table 1). As we did not formulate hypotheses about the different detail categories, we only report descriptives pertaining to details in the Results section.

Results

Difficulty of the task

To check whether truth tellers might have found the task less difficult than malingerers an independent t-test was conducted. However, truth tellers and malingerers reported similar difficulty levels, means being 4.10 (SD = 1.39) and 4.46 (SD = 1.40), respectively, t (123) = 1.36, p = .18).

Length of the statements

On average, participants produced 89.26 words per statement. Truth tellers provided significantly shorter statements (M = 66.71, SD = 48.76) than malingerers (M = 100.27, SD = 83.52), t (123) = 2.38, p = .02,d = .49.

Numberof verifiable and non-verifiable details

The difference between truth tellers (M = .93, SD = 2.26) and malingerers (M = .45, SD = 1.61) in number of verifiable details reported was not significant, t (123) = 1.34, p = .18, d = .25). However, truth tellers reported significantly less non-verifiable details (M = 18.83, SD = 10.43) than malingerers (M = 28.29, SD = 21.32), t (123) = 2.69, p = .01; d = .56, which partially supports Hypothesis 1.

Proportions of verifiable details

Verifiable details were reported by 16.8% of participants. Of the total number of provided details, verifiable information comprised 2.4%. Calculating the proportion of verifiable details (verifiable details / total of details), truth tellers had significantly higher proportions (M = .05, SD = .12) than malingerers (M = .01, SD = .03), t (123) = 2.43, p = .01, d = .46. This result supports Hypothesis 2.

Number of (verifiable and non-verifiable) perceptual, spatial, temporal, and descriptive details

Exploring the potential differences between groups in different categories of details, we found that truth tellers (M = .83, SD = 1.96) provided a significantly higher number of descriptive verifiable details than malingerers (M = .32, SD = 1.01), t (123) = 1.91, p = .03, d = .33. However, truth tellers reported significantly less (M = 4.22, SD = 3.63) perceptual non-verifiable details, t (123) = 4.30, p = .001, d = .86, than malingerers (M = 8.09, SD = 5.18). The same was found for descriptive non-verifiable details, truthtellers M = 10.66 (SD = 6.14),

malingerers M =14.85 (SD = 13.01), t (123) = 1.95, p = .02, d = .41, (see supplemental Table 2 and 3).

Study 2

The results of Study 1 revealed that malingerers used longer statements richer in non-verifiable details. Truth tellers produced higher proportions of verifiable details than malingerers – although the proportion of verifiable details produced was low in both conditions . Thus, our results are in line with previous studies on the Verifiability Approach (Nahari & Vrij, 2014; Nahari et al., 2014a, b) and also suggest that low verifiability reports might be a feature of people who malinger suffering from physical symptoms. Therefore, in Study 2 we tested whether differences in verifiability between truth tellers and liars would become more pronounced when participants are given additional instructions about verifiable details, as was found in previous studies (see Nahari et al., 2014b; Vrij et al., 2016; Harvey et al., 2016).

Method

Participants

105 undergraduate psychology students were recruited. Participants' age ranged from 18 to 26 years, with an average of 20 years (SD = 1.48). The majority were women (74%).

From the total number of participants, 38 reported to having physical symptoms, while 67 denied suffering from any physical condition. Therefore, as in the previous study, participants were allocated to two groups: truth tellers (with real symptoms) and malingerers (fabricating an account of symptoms).

Procedure

Study 2 followed a similar procedure as Study 1. Participants had an option to choose one of ten symptoms from the list or to add a new one (see Table 1). However, unlike our first study, before starting with writing the statements about their symptoms, the participants were

given an 'Information Protocol', which informed them that the details they provide may be checked (as in Harvey et al., 2016). The Information Protocol explicitly outlined what kind of information is considered a verifiable detail: 'We know from research that liars prefer to avoid providing details that can be verified whereas truth tellers prefer to provide verifiable details. Therefore, we are going to give your statement to medical professionals and ask them to decide if your statement is truthful, based on the extent to which the details you provide can be verified. Verifiable details are activities that can be documented and therefore verifiable (phone calls, doctor appointment, prescriptions etc., or activities that could be checked through blood analysis and medical documentation), carried out with another person (that can be identified), witnessed by another person (identifiable person), or recorded by CCTV cameras. Details that do not meet any of these criteria are considered to be unverifiable.'

After writing the statement, using 5-point Likert scales (1 = completely unmotivated; 5 = strongly motivated), we asked participants how motivated they had been to write down a convincing statement and to what extent they thought to have succeeded in this. Participants were also asked to report how strongly they believed that the details they provided would be checked by researchers on 5-point Likert scale (1= definitely no; 5 = definitely yes).

We asked malingerers whether they had been using bluffing as a strategy in writing their statements. Bluffing was defined as providing false verifiable details. The possible answers were 'Yes','Maybe', and 'No'. Perhaps the easiest way of bluffing is to confabulate about a person who can confirm the story (Culhane, Hosch, & Kehn, 2008). In this context, this might be a person who the individual claims has witnessed them experiencing the symptoms or who they have confided in about their symptoms. Therefore, to investigate wheather malingerers refer to false witnesses, we coded every statement in which a close person (parents, girlfriend/boyfriend, flatmate) was mentioned. After finishing the task, all participants were thanked for participating and rewarded with one research credit.

Coding

As in Study 1, all statements were coded by one coder, while the second coder scored a randomly selected 20% of all statements. Both coders were blind to the veracity of statements. The ICC's between coders was excellent for verifiable details (ICC = .94), non-verifiable details (ICC = .97), and for the total sum of details (ICC = .98). The ICC's for other categories of details also indicated good agreement (all ICC's > .80; see supplemental Table 1).

Results

Motivation, estimation of success, difficulty of the task, and belief that statements will be checked

Truth tellers reported (M = 3.53, SD = .79) a comparable level of motivation as malingerers (M = 3.43, SD = .80), t (103) =.57, p = .57. Also, the truth tellers (M = 3.53 SD = .76) did not differ from malingerers (M = 3.31 (SD = .96) in how they rated their success, t (103) = 1.17, p = .24. As in Study 1, difficulty of the task was rated on a 7-point Likert scale. Truth tellers (M = 3.76, SD = 1.28) and malingerers (M = 3.42, SD = 1.29) did not differ with respect to their difficulty ratings, t (103) = 1.32, p = .19.

Both truth tellers (M = 3.50, SD = .89) and malingerers (M = 3.15, SD = .96) were moderately convinced in the possibility that the veracity of their statements will be checked, and the difference between groups was not significant, t (103) = 1.85, p = .07.

Length of the statements

On average, participants produced 142.47 words per statement. The length of the statements was not significantly different for truth tellers (M = 152.63, SD = 111.16) and malingerers (M = 136.70, SD = 85.29), t (103) = .82, p = .41.

Number of verifiable and non-verifiable details

Truth tellers (M = 8.26, SD = 15.31) and malingerers (M = 6.66, SD = 9.02) did not differ in number of generated verifiable details, t (103) = .68, p = .50. The group difference in number of non-verifiable details was not significant either, t (103) = .63, p = .53, with truth tellers (M = 48.92,SD = 32.76) and malingerers (M = 45.03,SD = 29.44) producing a comparable number of such details.

Proportions of verifiable details

The number of participants providing verifiable details was much higher than in study 1 (57.1% vs. 16.8%). Verifiable details formed 13.1% (2.4% in study 1) of the overall number of details in all statements. The average proportion of verifiable details (verifiable details / total of details) was .12 (SD = .15) for truth tellers, and .13 (SD = .12) for malingerers; this difference was not significant, t (103) = .30, p = .77.

- Insert Table 2 about here -

Bluffing as a strategy

From the total number of malingerers, 17 participants (25.4%) reported that they 'maybe' had used bluffing, while 19 malingerers (28.4%) admitted providing false verifiable details. From a total of 41 malingerers who provided (false) verifiable details, 63.4% mentioned a close person who could confirm their story. On the other hand, 57.9% of truth tellers also provided information about family members or close people who could confirm their story. The association between veracity and frequency of mentioning close people was not significant, $X^2(1) = 1.03$, p = .31.

Number of (verifiable and non-verifiable) perceptual, spatial, temporal, and descriptive details

Truth tellers produced significantly more spatial verifiable details (M = .87, SD = 2.07) than malingerers (M = .15, SD = .44), t (103) = 2.75, p = .01, d = .48[1]. A similar pattern was observed for the number of spatial non-verifiable details, t (103) = 2.67, p = .001,d = .51, with truth tellers generating more information about locations or spatial arrangement of people and objects (M = 2.79, SD = 3.04) than malingerers (M = 1.52, SD = 1.82). Group differences with regard to the other details categories did not reach significance (see supplemental Table 2 and 3).

Discussion

We examined whether the Verifiability Approach (Nahari & Vrij, 2014) could differentiate between people who are suffering from common physical symptoms and those who are malingering such symptoms. The main findings of our studies can be summarized as follows: Truth tellers included a higher proportion of verifiable details despite generating shorter statements than malingerers, which supports the Verifiability Approach. However, this effect only emerged in Study 1 where participants were not provided with an instruction to include verifiable detail. When the instruction was provided (Study 2), no difference between truth tellers and malingerers in non/verifiable details emerged. These results appear to indicate that the instruction weakened the effect of the Verifiability Approach - unlike in previous studies where the use of such an instruction enhanced the differences between truthful and deceptive accounts. This discrepancy suggests that detecting malingerers using the Verifiability Approach may be more effective if the patients are required to provide their

[1] Because of the low number of participants in both groups, we also calculated a Mann-Whitney U test (U test = 1052.00, z = 2.04, p = .02), which also yielded a significant result.

reports spontaneously – rather than warning them that their reports will be examined for verifiable details.

We believe this discrepancy in findings is related to different levels of difficulty to incorporate false verifable details into an account in this specific setting. Note that bluffers always run the risk that the investigator will actually check their account. When they are not fully convinced that their statements will be reviewed - which we checked and found in study 2 – they might be more prone to bluffing because the risk of being caught seems low. The most popular way of bluffing reported in the current research was claiming that another person could confirm the account, most frequently a person closely related to malingerer (e.g., parents, boyfriend, flatmate) (see also Culhane et al., 2008). Actually, mentioning close people as witnesses is a clever strategy because the majority of people are willing to corroborate a statement of a close friend or relative in order to help that person (Hosch et al., 2011).

However, providing false witnesses might be much more convinient in one context than in the other settings. For example, in a criminal setting, asking a friend to provide a false alibi is a risky approach. The criminal needs to inform the friend beforehand to pretend that s/he was with or spoke with the criminal, which means that the friend will be aware of the falsehood of criminal's statement. Criminals may be reluctant to do this, and if they are, they are unlikely to mention the friend during the interview. The same applies to insurance settings, because if a fraudulent claimant is using a false witness, that person would also have to be informed about the false scenario they have to report and confirm in the statement. Consistent with this, Vrij et al. (2016) found that only 17% of liars reported discussing the incident with the person they mentioned in their statements, compared with 77% of truth tellers. In a malingering situation, it is easier to actually fool friends because common physical symptoms are often not clearly visible to others. Therefore, even if a friend denied

noticing a malingerer's headache, the malingering would not necessarily be exposed as headaches are often not visible from someone's actions, and people often do not mention to others that they have a headache. In sum, bluffers may think it is easier to get away with false witnesses in malingering situations than in criminal and insurance settings. Further, when asked to rate the difficulty of writing the (false/true) statements, malingerers did not differ from truth tellers. This may indicate that providing false potentially checkable information did not pose a big challenge for malingerers.

Another point to be addressed concerns the length of the statements between groups in both studies. While truth tellers spontaneously wrote significantly shorter statements than malingerers, when we provided the Information Protocol, the difference was lost. Similar to these findings are the results of previous insurance claims studies in which researchers suggested that providing a detailed model statement about an unrelated topic would elicit more verbal clues of deception, such as longer and more detailed reports among truth tellers than among liars. However, the results showed that, even with the model statement, liars provided the same length of statements as truth tellers (Leal, Vrij, Warmelink, Verham, & Fisher, 2013).

The main disadvantage of the Verifiability Approach in a medico-legal context seems to be the low spontaneous production rate for verifiable details in genuine patients' report. The percentage of truth tellers who reported verifiable details in Study 1 was around 17%, while it was 57.1% in Study 2 following instructions to provide such details. This suggests that the majority of genuine patients experiencing physical symptoms of ill-health do not spontaneously provide checkable details. It is also possible that they simply might not have any checkable to report about. In the context of symptoms, the majority of information provided by patients is subjective, and mostly concentrated on their internal state, rather than on external or visible condition. Thus, the situations in which professionals have the option to

verify persons' symptoms complaints via cameras or witnesses may be extremely rare (Resnick et al., 2008). Additionally, people differ in the way they perceive their symptoms and behave when experiencing them (see Kolk, Hanewald, Schagen, & van Wijk, 2003; see also van Wijk, Huisman, & Kolk,1999). While one person may immediately calls a doctor or goes to the pharmacy, another person may just stay in their office, without complaining to anybody. Both persons are truth tellers, but the second one would not have any verifiable details to report concerning their physical symptoms of ill-health.

One important limitation of the current study is that we relied on self-reports for the selection of truth tellers and malingerers, without any independent check as to whether they actually suffered from the reported symptoms or not. However, the incidence of selected symptoms amongst truth tellers was consistent with previous research about symptoms most frequently experienced by non-malingers (see Petry et al, 2014; Dandachi-FitzGerald & Merckelbach, 2013).

Future Research

We do not exlude the possibility that, with certain adjustments, it may be possible to extend the Verifiability Approach into an efficient tool for the detection of malingering of physical symptoms. The adjustments should focus on making both malingerers and truth tellers more convinced that their statements will be checked, such as presenting the 'warning' that their statements will be checked multiple times during the reporting phase. It is reasonable to assume that if malingerers are sure that their reports will be questioned, they will be less willing to provide false verifiable details. Aditionally, the warning could include 'consequences' for such an act, because in reality people are confronted with losses if it is established that they malingered. However, such a warning could also influence truth tellers, who then will realize that they could be seen as malingerers, and they therefore may feel the need to write plausible statements.

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Table 1. *Frequencies and percentage of selected symptoms in truth tellers and instructed malingerers in both studies.*

Symptoms	Study 1		Study 2	
	Truth tellers	Malingerers	Truth tellers	Malingerers
	n (%)	*n* (%)	*n* (%)	*n* (%)
Back or neck pain	13 (31.7)	10 (11.9)	12 (31.6)	8 (11.9)
Headache	10 (24.4)	35 (41.7)	9 (23.7)	23 (34.3)
Fatigue or loss of energy	8 (19.5)	19 (22.6)	6 (15.8)	15 (22.6)
Upset stomach or indigestion	5 (12.2)	5 (5.9)	5 (13.2)	7 (10.4)
Insomnia or sleeping problems	2 (4.9)	10 (11.9)	1 (2.6)	5 (7.5)
Congested or runny nose	1 (2.4)	2 (2.4)	0	1 (1.5)
Joint pain or stiffness	1 (2.4)	0	1 (2.6)	0
Cough	1 (2.4)	0	1 (2.6)	4 (6.0)
Muscle pain	0	3 (3.6)	0	1 (1.5)
Low blood pressure or circulation problems	0	0	0	2 (3.0)
Added symptoms:				
- Vertigo	0	0	0	1 (1.5)
- Intestine pain	0	0	1 (2.6)	0
- Knee pain	0	0	1 (2.6)	0
- Sore throat	0	0	1 (2.6)	0
Total	41 (100)	84 (100)	38(100)	67(100)

Table 2. *Length of the statements, difficulty of the task, non-verifiable and verifiable details, in study 1 and study 2.*

Group	*N*	Length of the statements *M* (*SD*)	Difficulty of the task *M* (*SD*)	Number of non-verifiable details *M* (*SD*)	Proportion of verifiable details *M* (*SD*)
Study 1					
Truth tellers	41	66.71 (48.76)	4.10 (1.39)	10.43 (1.62)	.05 (.12)
Malingerers	84	100.27 (83.52)*	4.46 (1.40)	21.32 (2.33)	.01 (.03)
Sign.		*	/	**	*
Study 2					
Truth tellers	37	152.63 (111.16)	3.76 (1.28)	48.92 (32.76)	.12 (.15)
Malingerers	68	136.7 (85.29)	3.42 (1.29)	45.03 (29.44)	.13 (.12)
Sign.		/	/	/	/

Notes: * $p < 0.05$; ** $p < 0.01$; Length of the statements is calculated as sum of words; Difficulty of the task was graded using 7-point Likert scale; Proportion of verifiable details was calculated as verifiable details/ total details. Bonferroni post hoc correction was applied.