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Patient Deception in Healthcare: Longitudinal Effects of Different Educational Interventions

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Abstract:

Many professionals hold inaccurate beliefs about cues to deception and possess negative attitudes toward patient deception. Recent research has revealed that deception workshops can be effective in increasing accurate beliefs and reducing negative attitudes. The purpose of the current study was twofold: to explore the interdisciplinary delivery of education about patient deception, and to examine the longitudinal effects of teaching about deception. The study was conducted with 77 participants at three time intervals: pre-test, post-test, and three-month follow-up. Participants were provided with either a workshop or classroom discussion about deception after the pre-test and before the post-test. The workshop and discussion resulted in less negative attitudes for both delivery formats and from both disciplines. The change in attitudes was also sustained at the three month follow-up for the workshop condition. Teaching about patient deception, regardless of the format or discipline is effective in correcting inaccurate beliefs, reducing negative attitudes, and increased lie acceptability. Further implications and clinical applications are discussed.

Keywords: Deception; Patient Deception; Physical Therapists; Beliefs; Attitudes

Full Text:

A common thread found across healthcare is communication between patient and provider. Communication of symptoms is critical to proper assessment, diagnosis, and treatment. Hence, deceptive communication can be problematic. Patients lie to a variety of health-care providers, including doctors, physician assistants, nurses, psychologists, and physical therapists (Blanchard & Farber, 2016; Chavin, 2018; Curtis & Hart, 2019; Jung & Reidenberg, 2007; Levy et al., 2018). Though many patients have lied to a healthcare provider, patients do not lie often (Curtis & Hart, 2019). There does exist a smaller subset of the population who tell numerous lies, deemed prolific liars or pathological liars (Curtis & Hart, 2020; Serota et al., 2010; Serota & Levine, 2015). Whether most patients tell an occasional lie or some patients tell numerous lies, these lies may negatively affect the patient-provider relationship and treatment outcomes (Kelley et al., 2014; Newman & Strauss, 2003). Further, patient deception and fraud can be financially costly (Smith et al., 2012).

While patient deception poses a number of concerns, laypersons are generally not much better than chance at detecting deception (Bond & DePaulo, 2006) and educators and other professionals do not perform much better (Marksteiner et al., 2012; Vrij, 2000). Two reasons that people may not be good lie detectors is that they possess a number of inaccurate beliefs about deception or they rely on false indicators. Health-care providers, similar to most people, hold a number of beliefs about patients who lie, and the nonverbal, paraverbal, and verbal strategies that they use, such as thinking that people look away when they tell lies (Curtis, 2015; Curtis & Hart, 2015; Curtis et al., 2018; Global Deception Research Team, 2006; Marksteiner et al., 2012). These beliefs become concerning when health-care professionals also hold negative attitudes toward patients who lie (Curtis & Hart, 2015; Curtis, 2015; Curtis et al., 2018). Health-care professionals may hold negative attitudes toward patients who lie because of personal and professional values (Curtis & Hart, 2015). Most people dislike being the target of deception as it often damages trust in relationships (Mollering, 2009). Professionally, lying to patients is generally regarded as an unethical practice (Curtis & Kelley, 2019). On the other hand, patients who falsely describe their health history or falsely present clinical signs and symptoms may mislead health care provider's clinical judgment during physical assessments. In the physical therapy clinics, patients who falsely claim to be adhering to home exercise prescription may adversely affect the plan of care and the treatment outcomes. More specifically, if a patient is being deceptive about being compliant with their home exercise program, the physical therapist may attempt to progress them too quickly, thereby causing more injury.

Curtis and colleagues (2018) conducted a two-part study that investigated Commission on Accreditation in Physical Therapy Education (CAPTE) accredited doctor of physical therapy (DPT) programs and a sample of DPT students. They found that while many DPT programs had training and education related to ethics, patient and therapist deception was minimally included. The

second part of the study investigated DPT students' beliefs and attitudes prior to and following a workshop on deception. The results indicated that DPT students held many inaccurate beliefs about indicators of deception and negative attitudes toward patients who lie, prior to participation in the workshop. Following the workshop, DPT students had corrected several beliefs and reduced a number of negative attitudes toward patients who lie. While Curtis and colleagues (2018) conducted a novel study pertaining to patient deception, they mentioned limitations of a small sample size, the lasting effects, and not knowing whether the education could be delivered by other educators in various formats. Thus, the current study was designed to build upon the findings from Curtis and colleagues by addressing some of their stated limitations.

The purpose of the current study was twofold: 1) to explore the interdisciplinary delivery of education about patient deception, whether a specific format (workshop versus discussions) and discipline (psychology professor or physical therapy professor) was more effective; 2) to examine the longitudinal effects of teaching about deception. Additionally, the study aimed to recruit a larger sample than the study from Curtis and colleagues. We hypothesized that (a) DPT students would hold many inaccurate beliefs about indicators of deception and negative attitudes prior to the workshop or discussion, (b) that many beliefs and attitudes would be corrected following the workshop and discussions without being contingent upon the format or discipline, and (c) many of the beliefs and attitude changes would be sustained longitudinally.

METHOD

Participants

Seventy-seven participants were recruited from a DPT program at a southwestern university. Participants were recruited from three DPT classes: Evidence Based Practice in Physical Therapy (Educational Workshop; $n = 26$), Evidence Based Practice Seminar I (Classroom Discussion; $n = 25$), and Introduction to Clinical Education and Professionalism (Classroom Discussion; $n = 26$). Participants ranged in age from 21 to 35 years ($M = 24.56$, $SD = 2.59$). There were 51% female, 48% male participants, and 1% intersex. The majority of participants were European/Caucasian (78%) and held a bachelor of science degree (87%). Almost every DPT student had been shadowing licensed physical therapists in the clinics. The majority had participated in clinical integrations and at least one clinical practicum in acute care or musculoskeletal settings. Work settings of previous clinical experience varied, including hospital, outpatient clinic, private practice, rehabilitation center etc. Specialties in clinical experience also varied across participants.

Materials

Participants were provided with either a workshop or classroom discussion about deception after the pre-test and before the post-test. At each time interval, participants completed the Detection of Deception Questionnaire (DDQ), Attitudes Toward Patient Deception Scale (ATPDS), and the Revised Lie Acceptability Scale (RLAS; Curtis & Hart, 2015; Hart et al., 2010; Hart et al., 2006; Oliveira & Levine, 2008).

The DDQ is a 30-item questionnaire that initially asks participants to rate their confidence in detecting deception and suspected frequency that others lie to them. Following these two items, participants are asked to indicate across 28 behaviors whether the behavior increases, decreases or does not change when patients lie. Each item is analyzed independently of the others because not all behavioral cues of deception change in the same direction when people lie. Thus, no internal consistency analyses were conducted for these items. Each item's correctness is compared to indicators of deception from prior research (Akehurst et al., 1996; DePaulo et al. 2003; Hart et al., 2006; Hart et al., 2010; Sporer & Schwandt 2006; Vrij, 2008). This method has been used in other studies that explored beliefs about indicators of deception (e.g., Hart et al., 2006; Hart et al., 2010).

The ATPDS is a 24-item scale that measures practitioners' attitudes toward patients who lie on a seven point Likert-type rating scale. The scale has demonstrated high internal consistency reliability, convergent and discriminant validity, and has been used in other deception studies (Curtis, 2015; Curtis & Dickens, 2016; Curtis et al., 2017; Curtis & Hart, 2015). In the current study we removed one item, predictable, as it did not improve the reliability and was not directly related to the construct. In the current study, the internal consistency reliability was acceptable for all three times it was administered (Cronbach's $\alpha = .79, .83, \& .86$).

The RLAS is an eight-item inventory that assesses people's acceptability of lying behavior ($[\alpha] = .83$; Oliveira & Levine, 2008). Participants are asked to rate whether they agree with the items on a seven-point Likert-type rating scale. Internal consistency reliability was acceptable across three times of administration in the current study (Cronbach's $\alpha = .83, .88, \& .80$).

Educational Workshop. The same workshop that was mentioned by Curtis and colleagues (2018) was used in the current study. The workshop was one-hour in length and presented to DPT students by a counseling psychology professor. The workshop provided an overview of deception and relevant deception literature. Then the presenter discussed 28 indicators of deception which have been identified within research and asked DPT students to review these indicators in pairs. Following the discussion on indicators, the presenter discussed the importance of attitudes in practice and implications for the patient-practitioner relationship. When compared to watching a video control, the deception workshop has been shown to increase accurate beliefs about indicators of deception and decrease negative attitudes toward deception (Curtis & Dickens, 2016).

Classroom Discussions. An educational intervention was implemented that had been suggested as a means to improve accurate beliefs and reduce negative attitudes toward patient deception (Curtis, 2015). The classroom discussion was one hour and consisted of students reading research articles related to patient and client deception. Then, during class an instructor-led discussion took place pertaining to the articles, indicators of deception, and attitudes toward patient deception.

Procedure

The institutional review board approved the study. The study recruited DPT students and was conducted with three time intervals:

pretest, post-test, and three-month follow-up. Students were informed that the researchers were interested in collecting data from a deception training workshop and educational intervention, to be held during class time. Students were provided with an informed consent document and it was verbally discussed with the students. The DPT students were instructed that their participation in the research aspect was completely voluntary and there were no penalties for not participating in the research aspect. All students were provided with the pre-test measures: TATDS, DDQ, and RLAS. Then, students in Evidence Based Practice in Physical Therapy course were provided with the training workshop led by a counseling psychology professor. Students in Evidence Based Practice Seminar II and Introduction to Clinical Education and Professionalism courses engaged in the classroom discussion led by a physical therapy professor. Following the workshop and classroom discussions, the DPT students were asked to complete the same questionnaires. The participants then were provided with a debriefing form that asked participants to complete the same questionnaires three months later via online. After three months, the participants were provided with a link to the questionnaires, followed by a debriefing.

RESULTS

For the DDQ, one-sample t-tests were used to analyze beliefs about each of the 28 indicators of deception and whether they change compared to a no-change anchor of four, which is how the DDQ is analyzed in other studies (e.g., Hart et al., 2006). To avoid a type I error for conducting more than one f-test, a Bonferroni adjustment was applied (correction = .002). Prior to the workshop and classroom discussion, DPT students correctly identified seven indicators of deception (e.g., smiles, latency to respond; Table 1). Following the workshop and classroom discussion, DPT students correctly identified 27 of 28 indicators (Table 2). At three months, participants from the workshop group correctly identified 16 indicators of deception (Table 3). Due to their size all three tables can be found at the end of this article.

To examine if there was a difference between the workshop and classroom discussion, a multivariate analysis of variance (MANOVA) was used to test all 28 indicators of deception with format (workshop or discussion) as the between groups variable. A MANOVA revealed that there was no statistical significance between groups for beliefs about indicators prior to the workshop or discussion ($F(28,45) = .99$, Wilks $A = .62$, $p = .50$). Thus, both groups had the same baseline beliefs about indicators of deception prior to the workshop or discussion. There was statistical significance found between groups after completing the workshop or classroom discussion ($F(28,45) = 2.67$, Wilks $A = .38$, $p = .002$). Taken together, both groups improved their correct beliefs to 96% accuracy (27 of 28 indicators correct) regardless of the format delivery or professor who was teaching the students. The only differences between groups were the belief of "spontaneous corrections" and "increase in stories with contradictions" (see Table 2).

For the ATPDS, a sum score was produced for each time interval. To examine changes in attitudes across all three time intervals, a repeated measures analysis of variance (ANOVA) was conducted on the total attitude scores for the workshop group. Additionally, a repeated measures ANOVA was conducted for pre-test and post-test attitude scores, with format as the between groups variable. Participants' initial negative attitudes toward patient deception ($M = 107.90$, $SD = 10.23$) decreased after the workshop and classroom discussion interventions ($M = 102.62$, $SD = 8.33$, $F(1,69) = 23.81$, Wilks [$LAMBDA$] = .74, $p < .001$, [η^2].sup.2] = .26). The decrease in attitudes was not attributable to a specific intervention, as there was no statistical significance between groups ($F(1,69) = 1.80$, Wilks $A = .98$, $p = .18$). Participants in the workshop condition had changed their initial attitudes ($M = 108.27$, $SD = 11.87$) to hold fewer negative attitudes ($M = 101.86$, $SD = 5.98$) after the workshop and attitude changes were sustained three months later ($M = 101.85$, $SD = 7.31$, $F(2,5) = 6.03$, Wilks [$LAMBDA$] = 2.41, $p = .047$, [η^2].sup.2] = .71).

To examine lie acceptability, a repeated measures ANOVA was conducted for RLAS scores pre-test and post-test, with format as a between groups variable. The workshop and classroom discussion had an effect on lie acceptability ($F(1, 48) = 22.02$, Wilks [$LAMBDA$] = .69, $p < .001$, [η^2].sup.2] = .31). Participants' initial acceptance toward lying was lower ($M = 21.30$, $SD = 7.08$) prior to engaging in the workshop or the classroom discussion compared to their position after the educational interventions ($M = 24.34$, $SD = 7.06$). Further, the change in lie acceptability was not due to a specific format of educational intervention ($F(1, 48) = .02$, Wilks [$LAMBDA$] = 1.00, $p = .90$). Lastly, a paired-samples f-test was used to compare pre-and post-test RLAS scores for the discussion condition. The changes in lie acceptability for the workshop condition after the educational intervention ($M = 27.29$, $SD = 6.37$) were sustained three months later ($M = 27.43$, $SD = 4.86$, $t(6) = -.09$, $p = .93$).

DISCUSSION

Education about patient deception is an effective means to correct inaccurate beliefs and reduce negative attitudes toward patients who might lie. Building on previous work that revealed the impact of teaching DPT students about patient deception (Curtis et al., 2018), we found that the benefits of correcting inaccurate beliefs and reducing negative attitudes is achieved regardless of the format (e.g., workshop or classroom discussion) or discipline/teacher (psychologist or physical therapist). Additionally, the effects from an educational intervention are lasting, in that students retained several correct beliefs about indicators of deception and post-intervention attitudes were unchanged three months later.

Regarding beliefs, participants were most accurate directly after the educational interventions, in which they correctly identified 27 of 28 indicators of deception (96% accuracy). At the three-month follow-up, participants correctly identified 16 of 28 indicators (57% accuracy). While the accuracy decreased from time two to time three, accuracy at time three was still much higher than the initial baseline of correctly identifying six indicators (21% accuracy). Interestingly, the beliefs held at the three-month follow-up were, collectively, that behavioral indicators of deception do not change. Thus, participants may have created a heuristic for behavioral indicators of deception, thinking that most indicators show no reliable change when people lie. If this heuristic was developed, it serves to increase accuracy from initial positions but fails to get at the nuances of some behavioral indicators (e.g., increase in pitch). However, the benefit of no-change beliefs is that practitioners may not rely on non-diagnostic cues, such as eye contact (Bogaard, Meijer, Vrij, & Merckelbach, 2016). For example, the belief of gaze aversion when lying, a pervasive belief (Global Deception Research Team, 2006), was corrected and sustained for participants following both educational interventions.

Prior to the educational interventions, DPT students held a number of negative attitudes toward patients who lie, some of which were liking the patient less, having less enthusiasm to work with the patient, and viewing them as less compliant. These findings are similar to previous research (Curtis et al., 2018). Clinicians' negative attitudes are a concern due to how those attitudes may affect practice. Attitudes can influence and affect behavior (Bentler & Speckart, 1979; Fishbein & Ajzen, 1974). Negative attitudes held by physicians and physical therapists toward patients who are obese can affect the health-care professionals' behaviors by avoiding interactions with the patient (Foster et al., 2003; Hebl & Xu, 2001; Sack, Radler, Mairella, Touger-Decker, & Khan, 2009). In the current study, we found that two different educational interventions led by different health-care professionals were successful at reducing negative attitudes toward patients and increasing acceptability. Further, these changes in attitudes were sustained three months later, in the workshop group, when assessed individually. Thus, the attitudinal changes appear to be privately accepted rather than a public compliance (Sherif, 1966). These sustained changes give credence to educational interventions as a means to assist students and clinicians to work more effectively with their patients through the patient-therapist relationship. Many attitudinal changes may be due to DPT students considering their role in working with patients who lie. Some have suggested that a healthcare professional's role is not to be an interrogator but rather assess the function of the lie (Kottler & Carlson, 2011). Understanding that patients may lie with the function of impression management or to get something could help the provider to not react defensively, and instead be more informed about the patient's intentions. In fact, when patients lie, they may be doing so with the thought of protecting or helping the health-care provider (Curtis & Hart, 2019).

While this study revealed that beliefs and attitudes toward patient deception can be corrected and sustained, there are some limitations and considerations worth mentioning. A number of participants did not complete the measures three months after the educational intervention. Moreover, none of the participants from the classroom discussion completed the measures at three months. Due to this, it is not certain whether the participants in the classroom discussion condition maintained post-intervention beliefs and attitudes. Another limitation of the current study was that there was not a non-intervention control, which could threaten internal validity. However, previous research that has compared the same workshop to a control group found that mere exposure did not produce changes in beliefs and attitudes (Curtis & Dickens, 2016). Additionally, a limitation is not knowing how beliefs and attitudes toward deception are manifested within clinical practice. Future research may want to explore whether educational interventions directly affect the patient-practitioner relationship and aid in patient outcomes.

Many health-care professionals receive specific training in their respective areas of practice. Physical therapists are primarily trained to focus on restoring functioning, mobility, and decreasing pain for patients (American Physical Therapy Association, 2017). Counseling and clinical psychologists primarily focus on personal, relational, emotional, occupational, and psychological functioning for people at all ages (American Psychological Association, 2020). Interpersonal factors may be peripheral to some health-care professionals. However, factors, such as deception, can be impactful on the patient-therapist relationship and treatment. One way to bridge the peripheral interpersonal concerns of patients with other areas central to training is to utilize interprofessional education. Overall, we have found that education related to patient deception can be implemented by different health-care profession disciplines successfully, and should be considered in curriculum, training, continuing education, and collaborative practice.

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Table 1. Pre-test beliefs held about indicators of deception

Indicators	C	N	M	SD	t	Sig.													
Eye Contact	W 26	2.38	1.33	-6.2	0														
Eye Blinks	W 26	4.88	0.91	4.96	0	D 50 5.2 1.12 7.54 0													
Head Movements	W 26	4.88	1.28	3.54	0	D 50 4.74 1.19 4.39 0													
Smiles	W 26	3.69	1.26	-1.25	0.22	D 50 4.28 1.01 1.96 0.06													
Hand and Finger Movements	W 26	4.77	1.34	2.94	0.01	D 50 4.78 1.09 5.04 0													
Arm Movements	W 26	4.46	0.86	2.74	0.01	D 50 4.78 1.09 5.04 0													
Leg and Foot Movements	W 26	5.15	0.78	7.5	0	D 50 5.22 0.91 9.48 0													
Postural Shifts	W 26	5.35	1.23	5.58	0	D 50 6.36 7.08 2.36 0.02													
Shrugs	W 26	4.81	0.75	5.5	0	D 50 4.92 0.99 6.59 0													
The number of interruptions such as "uh" and "um": The number of	W 26	5.46	0.86	8.67	0	D 50 4.86 1.16 5.24 0													
pauses or hesitations in speech	W 26	5.19	1.2	5.06	0	D 50 4.72 1.33 3.84 0													
The amount of time before beginning to respond to a question	W 26	5.23	0.65	9.63	0	D 49 5.22 0.87 9.83 0													
Hectic speech patterns	W 26	5.22	0.87	9.83	0	D 49 5.22 0.87 9.83 0													
Changes in the pitch of voice	W 26	5.3	0.91	10.11	0	D 50 5 1.47 4.81 0													
The use of short, simple sentences	W 26	4.19	1.44	0.68	0.5	D 50 3.72 1.37 -1.44 0.16													
descriptions in stories and explanations	W 26	3.88	1.37	-0.43	0.67	D 50 3.72 1.29 -1.53 0.13													
Logically plausible descriptions	W 26	3.19	1.1	-3.76	0	D 50 2.6 1.07 -9.26 0													
stories and explanations	W 26	4.15	1.85	0.42	0.67	D 50 4.32 1.58 1.43 0.16													
Unusual details in descriptions	W 26	5.04	0.92	5.78	0	D 50 5.24 1.25 6.99 0													
Unnecessary details in descriptions	W 26	5.38	1.02	6.9	0	D 50 5.1 1.36 5.72 0													
Descriptions of their own feelings or the feeling of others	W 26	4.06	1.39	0.3	0.76	D 50 4.06 1.39 0.3 0.76													
Counting exactly what somebody had said in stories and explanations	W 26	4.08	1.74	0.23	0.82	D 50 4.08 1.74 0.23 0.82													
Spontaneous interactions with others in stories and explanations	W 26	5.15	1.19	4.95	0	D 50 5.1 1.49 5.23 0													
Claiming a lack of memory for certain events or information	W 26	5.42	1.1	6.59	0	D 50 5.1 1.39 5.6 0													
Contradictions	W 26	5.85	0.73	12.87	0	D 50 5.86 1.13 11.69 0													
Indicators C Change Prior Research	W Decrease	No D Decrease	Change	Eye Blinks	W Increase	No D Increase													
Head Movements	W Increase	No D Increase	Change	Smiles	W No Change	No D No Change													
Hand and Finger Movements	W Increase	No D Increase	Change	Arm Movements	W Increase	No D Increase													
Leg and Foot Movements	W Increase	No D Increase	Change	Postural Shifts	W Increase	No D Increase													
Shrugs	W Increase	No D Increase	Change	Gestures	W Increase	No D Increase													
The number of interruptions such as "uh" and "um": The number of	W Increase	No D Increase	Change	pauses or hesitations in speech	W Increase	No D Increase													
The amount of time before beginning to respond to a question	W Increase	No D Increase	Change	Hectic speech	W Increase	No D Increase													
Changes in the pitch of voice	W Increase	No D Increase	Change	The length of simple sentences	W No Change	No D No Change													
The use of short, simple sentences	W No Change	No D No Change	Change	descriptions in stories and explanations	W Decrease	No D Decrease													
Logically plausible descriptions	W Decrease	No D Decrease	Change	consistent descriptions	W Decrease	No D Decrease													
stories and explanations	W Decrease	No D Decrease	Change	Unusual details	W Increase	No D Increase													
Unnecessary details	W Increase	No D Increase	Change	Descriptions of their own feelings or the feeling of others	W No Change	No D No Change													
Counting exactly what somebody had said in stories and explanations	W No Change	No D No Change	Change	Spontaneous interactions with others	W No Change	No D No Change													
Claiming a lack of memory for certain events or information	W Increase	No D Increase	Change	Contradictions	W Increase	No D Increase													
Contradictions	W Increase	No D Increase	Change	Note: The students' accurate beliefs for indicators of deception are highlighted in light gray.															
Indicators C N M SD t Sig.	Eye Contact	W 26	4.12	0.52	1.14	0.26													
D 49	4.02	0.14	1	0.32	Head Movements	W 26	3.92	0.39	-1	0.33	D 49	4.02	0.14	1	0.32				
D 49	4.04	0.29	1	0.32	Hand and Finger Movements	W 26	2.5	1.63	-4.69	0	D 49	2.8	1.38	-6.09	0				
D 49	2.82	1.32	-6.29	0	Arm Movements	W 26	2.54	1.65	-4.5	0	D 49	2.82	1.32	-6.29	0				
D 49	0.2	1	0.33	D 49	3.92	0.4	-1.43	0.16	Shrugs	W 26	4	0	1	--	D 49	3.96	0.2	-1.43	0.16
D 49	0.2	1	0.33	D 49	3.92	0.4	-1.43	0.16	Gestures	W 26	4.04	0.2	1	0.33	D 49	4	0.2	1	0.33
D 49	4.62	1.13	2.77	0.01	pauses or hesitations in speech	W 26	6.12	0.86	12.49	0	D 49	4.12	0.67	1.29	0.2				
D 49	4.12	0.67	1.29	0.2	The amount of time before beginning to respond to a question	W 26	6.12	0.86	12.49	0	D 49	4.12	0.67	1.29	0.2				
D 49	4.12	0.67	1.29	0.2	Hectic speech	W 26	4.15	0.46	1.69	0.1	D 49	4.15	0.46	1.69	0.1				
D 49	4.15	0.46	1.69	0.1	patterns	W 26	3.42	1.27	-2.32	0.03	D 49	3.65	0.93	-2.62	0.01				
D 49	3.65	0.93	-2.62	0.01	The use of short, simple sentences	W 26	5.62	1.44	5.7	0	D 49	5.22	1.14	7.51	0				
D 49	5.22	1.14	7.51	0	descriptions in stories and explanations	W 26	2.31	1.09	-7.94	0	D 49	3.24	1.13	-4.69	0				
D 49	3.24	1.13	-4.69	0	Logically plausible descriptions	W 26	2.58	1.14	-6.38	0	D 49	2.78	0.98	-8.71	0				
D 49	2.78	0.98	-8.71	0	consistent descriptions	W 26	3.02	1.16	-5.89	0	D 49	3.02	1.16	-5.89	0				
D 49	3.02	1.16	-5.89	0	stories and explanations	W 26	4.12	0.43	1.36	0.18	D 48	4	0.92	0	1				
D 48	4	0.92	0	1	Unnecessary details in descriptions	W 26	4.08	0.27	1.44	0.16	D 49	3.96	0.64	-0.44	0.66				
D 49	3.96	0.64	-0.44	0.66	Descriptions of their own feelings or the feeling of others	W 26	3.81	0.63	-1.55	0.13	D 49	3.94	0.32	-1.35	0.18				
D 49	3.94	0.32	-1.35	0.18	Counting exactly what somebody had said in stories and explanations	W 26	2.31	1.23	-7.04	0	D 49	3.2	1.02	-5.46	0				
D 49	3.2	1.02	-5.46	0	Spontaneous interactions with others	W 26	3.73	0.87	-1.57	0.13	D 49	3.73	0.76	-2.45	0.02				
D 49	3.73	0.76	-2.45	0.02	others in stories and explanations	W 26	3.31	1.46	-2.41	0.02	D 49	3.51	1.04	-3.29	0				
D 49	3.51	1.04	-3.29	0	Claiming a lack of memory for certain events or information	W 26	3	1.5	-3.41	0	D 49	3.45	1.04	-3.7	0				
D 49	3.45	1.04	-3.7	0	Contradictions	W 26	3.96	1.08	-0.18	0.86	D 49	4.47	0.96	3.42	0				
D 49	4.47	0.96	3.42	0	Indicators C Change Prior Research	W No Change	No D No Change	Change	Eye Blinks	W No Change	No D No Change	Change	Head Movements	W No Change	No D No Change	Change			
D 49	4.47	0.96	3.42	0	Head Movements	W No Change	No D No Change	Change	Smiles	W No Change	No D No Change	Change	Hand and Finger Movements	W Decrease	No D Decrease	Change			
D 49	4.47	0.96	3.42	0	Smiles	W No Change	No D No Change	Change	Arm Movements	W Decrease	No D Decrease	Change	Leg and Foot Movements	W Decrease	No D Decrease	Change			
D 49	4.47	0.96	3.42	0	Arm Movements	W Decrease	No D Decrease	Change	Postural Shifts	W No Change	No D No Change	Change	Shrugs	W No Change	No D No Change	Change			
D 49	4.47	0.96	3.42	0	Postural Shifts	W No Change	No D No Change	Change	Gestures	W No Change	No D No Change	Change	The number of interruptions such as "uh" and "um": The number of	W No Change	No D No Change	Change			
D 49	4.47	0.96	3.42	0	Gestures	W No Change	No D No Change	Change	pauses or hesitations in speech	W No Change	No D No Change	Change	The amount of time before beginning to respond to a question	W Increase	No D Increase	Change			
D 49	4.47	0.96	3.42	0	The number of interruptions such as "uh" and "um": The number of	W No Change	No D No Change	Change	Hectic speech	W No Change	No D No Change	Change	Changes in the pitch of voice	W Increase	No D Increase	Change			
D 49	4.47	0.96	3.42	0	pauses or hesitations in speech	W No Change	No D No Change	Change	Changes in the pitch of voice	W Increase	No D Increase	Change	The length of simple sentences	W Increase	No D Increase	Change			
D 49	4.47	0.96	3.42	0	The amount of time before beginning to respond to a question	W Increase	No D Increase	Change	The length of simple sentences	W Increase	No D Increase	Change	descriptions in stories and explanations	W Decrease	No D Decrease	Change			
D 49	4.47	0.96	3.42	0	Hectic speech	W No Change	No D No Change	Change	descriptions in stories and explanations	W Decrease	No D Decrease	Change	Logically plausible descriptions	W Decrease	No D Decrease	Change			
D 49	4.47	0.96	3.42	0	Changes in the pitch of voice	W No Change	No D No Change	Change	Logically plausible descriptions	W Decrease	No D Decrease	Change	consistent descriptions	W Decrease	No D Decrease	Change			
D 49	4.47	0.96	3.42	0	The length of simple sentences	W Increase	No D Increase	Change	consistent descriptions	W Decrease	No D Decrease	Change	stories and explanations	W Decrease	No D Decrease	Change			
D 49	4.47	0.96	3.42	0	descriptions in stories and explanations	W Decrease	No D Decrease	Change	stories and explanations	W Decrease	No D Decrease	Change	Unusual details	W Increase	No D Increase	Change			
D 49	4.47	0.96	3.42	0	Logically plausible descriptions	W Decrease	No D Decrease	Change	Unusual details	W Increase	No D Increase	Change	Descriptions of their own feelings or the feeling of others	W No Change	No D No Change	Change			
D 49	4.47	0.96	3.42	0	consistent descriptions	W Decrease	No D Decrease	Change	Descriptions of their own feelings or the feeling of others	W No Change	No D No Change	Change	Counting exactly what somebody had said in stories and explanations	W Decrease	No D Decrease	Change			
D 49	4.47	0.96	3.42	0	stories and explanations	W Decrease	No D Decrease	Change	Counting exactly what somebody had said in stories and explanations	W Decrease	No D Decrease	Change	Spontaneous interactions with others	W No Change	No D No Change	Change			
D 49	4.47	0.96	3.42	0	Unusual details	W Increase	No D Increase	Change	Spontaneous interactions with others	W No Change	No D No Change	Change	Claiming a lack of memory for certain events or information	W Increase	No D Increase	Change			
D 49	4.47	0.96	3.42	0	Descriptions of their own feelings or the feeling of others	W No Change	No D No Change	Change	Claiming a lack of memory for certain events or information	W Increase	No D Increase	Change	Contradictions	W Increase	No D Increase	Change			
D 49	4.47	0.96	3.42	0	Counting exactly what somebody had said in stories and explanations	W Decrease	No D Decrease	Change	Contradictions	W Increase	No D Increase	Change	Note: The students' accurate beliefs for indicators of deception are highlighted in light gray.						

explanations Descriptions of W No Change No Change interactions with D No Change others in stories and explanations
 Spontaneous W No Change Decrease corrections in D Decrease stories and explanations Claiming a lack W Decrease Decrease
 of memory for D Decrease certain events or information Stories with W No Change No Change contradictions D Increase Note:
 The students' accurate beliefs for indicators of deception are highlighted in light gray. D = Discussion; W = Workshop
 Table 3. Three month follow-up for educational workshop Indicators N M SD t Sig. Change Prior Research Eye contact: 7
 4.57 0.53 2.83 .030 No Change No Change Eyeblinks 7 4.14 0.38 1.00 .356 No Change No Change Head movements 7 4.14 0.38
 1.00 .356 No Change No Change Smiles: 7 4.14 0.38 1.00 .356 No Change No Change Hand and finger 7 3.71 1.11 0.68 .522 No
 Change Decrease movements: Arm movements: 7 3.57 0.98 1.16 .289 No Change Decrease Leg and foot 7 3.71 1.11 0.68 .522 No
 Change Decrease movements: Postural shifts: 7 3.71 1.38 -- .604 No No 0.55 Change Change Shrugs: 7 3.71 0.49 1.55 .172 No
 Change No Change Gestures: 7 3.86 0.90 -- .689 No No The number of 7 4.43 1.13 1.00 .356 No Change No Change speech
 interruptions such as "uh" and "um": The number of 7 4.14 1.21 0.31 .766 No Change No Change pauses or hesitations in
 speech: The amount of 7 4.43 0.79 1.44 .200 No Change Increase time before beginning to respond to a question: Hectic
 speech 7 4.29 0.49 1.55 .172 No Change No Change patterns: Changes in the 7 4.43 0.79 1.44 .200 No Change Increase pitch
 of voice: The length of 7 3.57 1.13 1.00 .356 No Change No Change answers: The use of short, 7 4.57 0.79 1.92 .103 No
 Change Increase simple sentences in stories and explanations: The use of 7 3.57 1.13 1.00 .356 No Change Decrease
 plausible descriptions in stories and explanations: Logically 7 3.43 0.79 1.92 .103 No Change Decrease consistent stories
 and explanations: The amount of 7 3.43 0.79 1.92 .103 No Change Decrease detailed descriptions in stories and
 explanations: Unusual details 7 3.71 1.11 -- .522 No No In 0.68 Change Change descriptions: Unnecessary 7 4.14 1.21 0.31
 .766 No Change No Change details in descriptions: Descriptions of 7 3.57 0.98 1.16 .289 No Change No Change their own
 feelings or the feeling of others: Recounting 7 3.71 0.95 0.79 .457 No Change Decrease exactly what somebody had said in
 stories and explanations: Descriptions of 7 3.86 1.21 0.31 .766 No Change No Change interactions with others in stories
 and explanations: Spontaneous 7 3.57 1.13 1.00 .356 No Change Decrease corrections in stories and explanations: Claiming
 a lack 7 3.86 1.21 0.31 .766 No Change Decrease of memory for certain events or information: Stories with 7 4.57 0.98
 1.55 .172 No Change No Change contradictions:

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