An experimental study on covert law-enforcement: Exploring the relationship of adaptability and trustworthiness on goal achievement in undercover work

Master's Thesis

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Abstract

Within covert law-enforcement, there are factors that have not received much empirical attention which may be important in the success, selection, and training of undercover agents. One such factor is adaptability. This research aimed to measure adaptability during undercover missions, by using a novel experimental set-up that provides participants an objective, an expectation, and an expectancy violation in order to facilitate adaptive behavior. Furthermore, the influence of trust as a mediator on adaptability and success on the tasks was measured. It was expected that adaptability predicted success and trustworthiness, with trustworthiness predicting success as a mediator. As no significant results were found, exploratory analyses were done, furthermore providing no significant results. However, this research provides interesting avenues for future research. The results give rise to the concept of a negative relationship between affective/cognitive trust and success on an undercover task that requires adaptability. In future research, this concept to be explored further, this time implementing an adaptability rating done by the researcher instead of the participant to eliminate self-reporting bias.

Keywords: Adaptability, trust, covert law-enforcement

Introduction

Undercover Operatives

When thinking about undercover agents one would be likely to think about big cases, like the contribution of Michael Malone to the conviction of notorious crime boss Al Capone, or the indictment of 200 New York Mafia members with the help of Joe Pistone. Both of these cases involved critical undercover work, with the agents maintaining a false identity while risking torture and death. These agents worked their way up to the inner circles of organised crime by being strategic, stress-resistant, and, above all, believable. Using these skills, they were able to adapt to the ways of the criminals and, eventually, win their trust. In doing so, they were able to acquire investigative information on their targets and contribute to the conviction of these criminals.

Because of the secretive nature of undercover policing, details as to the personality and psychological traits of these undercover agents are difficult to obtain (Picano & Roland, 2012), and it could be speculated that it is unknown how much information on this topic exists, because of this secretive nature. Traits that were previously seen as contributing positively to undercover agent functioning are now being discovered as having negative consequences (Dimitrovska, 2017). Especially characteristics that trace back to a militaristic mindset, such as a tendency to rigidly stick to procedures, are being found as not leading to successful undercover work: undercover operatives that stick to a certain process without deviation in a ‘quasi-militaristic’ way risk losing their cover because of this inflexibility (Dimitrovska, 2017). On the other side, operatives that do not hold themselves to set procedures risk losing their mental compass or experiencing mental health problems that go with a loss of personal identity (Dimitrovska, 2017).

In contrast to the characteristics that lead to unsuccessful undercover work, within the amount of research that has been done, a few general characteristics have shown to be linked

with the success of undercover law enforcement officers. These characteristics include problem-solving, stress resistance, self-discipline, and emotional stability. (Love, 1990; Girodo, 1997; Picano & Roland, 2012). These concepts are relatively easy to understand from a teaching and training point of view, and it may be fairly easy to select and train undercover agents according to these standards.

Another factor that is important in the success, selection, and training of undercover agents is adaptability (Girodo, 1997). However, an issue with adaptability is that it is a broad term that allows multiple interpretations, depending on the context in which is it implemented. Furthermore, adaptability comes with different definitions in different academic studies, even though the same construct is being described. In order to be able to investigate adaptability in undercover operatives, a clear definition for adaptability in this context will first have to be established.

Adaptability

Defining Adaptability

To define adaptability in the context of undercover work, the general definition of adaptability should first be researched. To investigate this, Martin et al. (2012) developed the adaptability scale, which comprised of items that met the following criteria: Items on this scale met the criteria of facilitating appropriate cognitive, behavioral, or affective adjustment in response to uncertainty and/or novelty (Martin et al., 2012). This scale identified adaptability as a separate single construct, subsumed by a cognitive-behavioural, and an affective factor. This last development forms the definition of adaptability for this research, which is, as in Collie et al. (2016): *the cognitive, behavioural, and emotional adjustments that individuals make to manage changing, novel, and uncertain situations and events.* As mentioned above, the construct of adaptability consisted of a cognitive-behavioural and an affective factor. These factors can be split into three different forms of adaptability (Martin et

al., 2013). The cognitive-behavioural factor encompasses cognitive and behavioural adaptability, whereas the affective factor consists of affective adaptability. The construct of adaptability and its factors according to Martin (2013) can be found in the figure below.

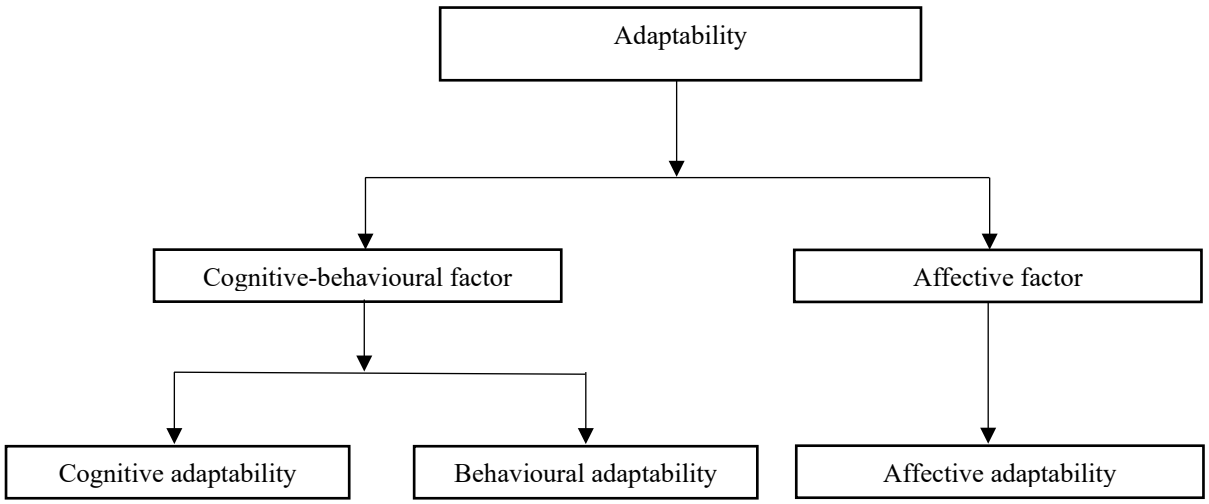

Figure 1. The construct of adaptability and its factors as described by Martin et al. (2013).

Cognitive Adaptability. This construct can be divided into two processes: Cognitive appraisal and cognitive regulation. Cognitive appraisal concerns the manner in which individuals think about and evaluate a target phenomenon (Folkman et al., 1986). Cognitive regulation involves the ability of an individual to adapt their thinking to process novelties in the ongoing situation (Heckhausen & Schulz, 1993).

Behavioural Adaptability. This type of adaptability concerns observable behaviour. It relates to the degree to which individuals are able to implement new behaviour or adjust existing behaviour to adapt to a new situation (Schulz & Heckhausen, 1996).

Affective Adaptability. Affective adaptability involves the emotional response in a novel situation. It has been found that affect plays an important role in human interaction (Ekman, 1992) and that the adaptation of emotional responses can influence interaction by altering the shape and mode of delivery (Gross & John, 2003). By identifying emotions that

need to be adjusted, the affective response an individual presents can be altered in an attempt to positively influence the situation at hand (Martin et al., 2013).

Adaptability in Law Enforcement

Although adaptability plays an important role in the functioning of undercover agents, there has only been little research on what the concept of adaptability comprises within the context of law enforcement. The research by Martin et al. (2013, 2017) focused on (young) academics. Other researches have been done regarding adaptability, in varying fields, such as teaching (Collie & Martin, 2016), sales (Spiro & Weitz, 1990), work performance (Pulakos, Arad, Donovan, & Plamondon, 2000), and naturalistic decision-making (Klein et al., 2014). As research on adaptability in a law enforcement setting has not been done yet and could be of considerable importance for personnel selection and training purposed within law enforcement, this research will aim to investigate adaptability within a law enforcement context.

Now that adaptability is defined as the cognitive, behavioural, and emotional adjustments that individuals make to manage changing, novel, and uncertain situations and events, it can be seen why this skill is an important one to possess for undercover operatives. These operatives have to adapt their behaviour to fit with the behaviour of their targets, adapt cognitively in order to maintain their cover by effectively being someone else, and adjust their emotional responses when dealing with the criminal acts that their targets exhibit. Next to having to maintain the guise of criminality, they have to react convincingly to novel and uncertain situations that occur during their time undercover. For example, an undercover operative might expect to meet with a certain informant, but the informant brings an unexpected individual along requiring the undercover operative to adjust their behaviour accordingly to maintain their guise. The essence of undercover work assumes adaptability, as the undercover operative is constantly required to balance their participation in criminal

activities and not conducting illegalities, while at the same time being required to fulfil their objective, all the while upholding a good status within the criminal group.

Trust

The Influence of Trust

Next to the different types of adaptability described above, there is another component that contributes to the achievements of successful undercover operatives like Malone and Pistone: they got their targets to trust them. Trust is another essential component in undercover work, as obtaining sensitive information about various illicit deeds is not possible without the criminals trusting an undercover operative. Various studies have examined trust, as it is important in many other fields, such as strategy and economics (Bhattacharya et al., 1998) and micro-organisational behaviour (Mishra & Spreitzer, 1998). Because of the large amount of research that has been done on trust, a definition that fits with trust within a covert operations context has been established in a cross-disciplinal study by Rousseau et al. (1998). Here, trust was defined as a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another. This definition is important for trust in an undercover situation, as criminals are usually wary of trusting others that can potentially harm their illegal practices, and with that themselves. Establishing trust thus requires an individual who can adapt to the situation adequately, lowering distrust and causing the criminal to be more likely to trust the undercover operative. If the undercover operative can look like, feel like, and, using their adaptive skill, act like a criminal, it is expected that the criminal will be more likely to trust this undercover operative, hopefully leading to more effective undercover work. It, thus, seems essential for an undercover operative to develop their adaptive skills, in order to increase trust, and, with that, increase their success on undercover tasks that require adaptability.

In order to further understand trust, the factors that make up this construct should be investigated. It should be noted that there is a distinction between trust as a state, where one is willing to accept vulnerability to a trustee based on positive expectations of their actions, and trustworthiness, which concerns the qualities a trustee possesses that make it more likely for other to trust them. A study by Mayer et al. (1995) investigated trustworthiness, which appears to be important for undercover operatives. Should these operatives score high on trustworthiness, their criminal targets will be more likely to trust them, which will, as described above, be beneficial for the operational success of the undercover operatives. In their study, Mayer et al. (1995) found three main factors involved in trustworthiness.

Ability. This factor relates to one's skills and competencies that relate to the matter for which this individual is to be trusted. The trustworthiness that is established as a result of ability is domain-specific, as one could be very proficient on, for example, a planning level, while at the same time not being very able when it comes to negotiation situations. The individual in this example would be trusted on a planning level, but social tasks will be more likely left to a person that is more socially competent.

Benevolence. Another way that trustworthiness is facilitated is through benevolence. This concept is understood as the willingness to do good for the other, without an egocentric profit motive. In a trust setting, this implies that the trustee has some specific affinity to the trustor. An example of this would be that of a student and a mentor. The mentor does not have a clear egocentric motive but still wants the student to do well. This implies some level of benevolence; the willingness of the trustor to do good for the trustee, regardless of egocentric gain. Although within a criminal context there is often a clear financial motive, for example in gangs, the feeling of being an in-group could also cause benevolent behaviour, as in-group members become attached to one another.

Integrity. Lastly, integrity is a factor found important in trustworthiness. Integrity can

contribute to trustworthiness when the principles of the trustor align with that of the trustee. This alignment can be displayed by consistency in actions, adherence to promises made in the past, and having a strong sense of justice (McFall, 1987). Especially consistency and adherence to promises seems to be important in a covert operations context, as it would be more likely for the target to trust the undercover agent when they consistently maintain their criminal guise and keep their promises.

This Study

With the factors influencing adaptability and trustworthiness in mind, it can be questioned whether these two constructs or connected to one another. If the failure to adapt to new situations leads to a reduced level of trust, would an increase in adaptability have a positive influence on trust? To be able to determine what influence adaptability can have on trust and, thus, the success of undercover agents on their tasks, this paper will investigate the construct of trustworthiness, so that possible relationships between adaptability, trust, and success on tasks that require adaptability (e.g. undercover operations) can be found. The current research will focus on working towards an answer to this question, with the aim to examine the relationship between adaptability and trustworthiness. To research this relationship, participants will take part in an experimental set-up based on a novel framework developed after observations of police undercover agent training at the Los Angeles Police Department (S. Oleszkiewicz, September 2018). This novel framework will elicit adaptive responses in participants, allowing for a quantitative analysis of these adaptive responses.

As adaptability is described as the cognitive, behavioural, and emotional adjustments that individuals make to manage changing, novel, and uncertain situations and events, an experimental setup was created in which three components were essential to elicit adaptive behaviour: adaptive responses are elicited by giving participants an objective (what the participant will do during the experiment), an expectation (information about what is going

to/expected to happen), and, lastly, by violating the expectation that was created (using information that misguides the participant). Based on this novel framework, this study will divide participants into one of two groups: agents or granters. The agents will have to fulfill an objective, while the granters will have to interact with the agent, possibly helping or impeding the agent from fulfilling their objective, depending on how they interpret their instructions.

After adaptive responses have been elicited, the participants in this study will fill in various questionnaires that aim to measure adaptability and trustworthiness, so that a mediation analysis can be done to investigate the relationship between adaptability and success, with trustworthiness as a mediator.

Using this novel set-up to measure adaptability and trustworthiness in a goal-oriented setting, the following research question is aimed to be answered by conducting a mediation analysis:

To which extent is the relationship between adaptability and the adaptive success of agents in an undercover task mediated by trustworthiness?

As for the different elements that possibly interact with adaptability, the following sub-questions have been formulated to fit with the mediation analysis:

- To which extent is there a relationship between trustworthiness and success on a task that requires adaptation?
- To which extent is there a relationship between cognitive, affective, and behavioural adaptation and success on a task that requires adaptation?
- To which extent is there a relationship between cognitive/behavioural/affective adaptation and trustworthiness?

As mentioned above, it is expected that trustworthiness plays an important role in the success of adaptive tasks. Therefore, it is hypothesised that:

H1: A higher rating on trust from the granter to the agent will predict a higher success rate on the three operations.

Furthermore, as the tasks ask for adaptive behaviour, it is hypothesised that:

H2: Higher adaptability will predict a higher success rate on the three operations.

As adaptive behaviour facilitates trust by decreasing dissonance between the two parties, as the agent is more able to adapt to the expectations and wishes of the target, it is hypothesised that:

H3: Higher cognitive, affective, and behavioural adaptation scores will predict a higher trust rating from the granter about the agent.

Lastly, as this study will conduct a mediation analysis, with the influence of adaptability on success being mediated by rated trust, it is hypothesised that:

H4: Higher adaptability will predict a higher success through the positive interaction between adaptability and rated trust.

Method

As this research is part of a larger study into adaptability as a behavioral response, only the methods relevant to examining the relationship between trustworthiness and adaptability will be explained. The study consisted of two groups of participants: agents and granters. These two groups will be discussed separately where needed.

Design

The current research employed a repeated-measure design for examining adaptability during three consecutive missions (Operation 1, Operation 2, Operation 3). To examine possible subject-expectancy effects (Supino & Borer, 2012) the operations were administered in three different orders. The relevant measures for the present study were as follows: for the agents, adaptability was examined using a questionnaire after each operation, with questions

that aimed to measure cognitive, affective, and behavioral adaptability. Agents also indicated whether they were successful in their task. In a final questionnaire after the last operation, agents filled in how they rated their trust in the granter. The granters also filled in a questionnaire after their participation. This questionnaire asked whether the agents succeeded in their task, as well as the trust the granter had in the agent, with questions aiming to measure ability, benevolence, and integrity.

Participants

Granters. The granters were recruited with an advertisement looking for research subjects as part of a study on employee behaviour at the university. Participation was voluntary, and the granters were rewarded for their time (approx. 30 minutes) with a €5 voucher. Participants who took part via the University of Twente's online recruitment system SONA could also choose to receive credits in this system. These credits are needed for psychology students at the University of Twente in order to pass their bachelor study, resulting in an increased incentive for these psychology students to participate in various studies. Participants, who were mostly university students in the role of granter ($N = 96$) included 52 males and 43 females with ages ranging between 18 and 34 years old ($M = 22.6$, $SD = 3.12$). They were randomly assigned to one of the three operations (secret note; $N = 26$, photo-evidence; $N = 28$, fingerprints; $N = 30$), while still under the impression that they would participate in a 'normal day on the job'.

Agents. The agents were recruited for a study that was examining behaviour (e.g., perceptions and decisions) of participants acting as agents during mock undercover operations. Participation was voluntary, and respondents were rewarded for their time with a €10 voucher. Participants who took part via the University of Twente's online recruitment system SONA could also choose to receive credits in this system. Participants ($N = 31$), who were mostly university students included 20 males and 11 females between the ages of 19

and 41 years old (M = 22.0, SD = 3.95). Initially, 32 participants were recruited. However, as one of the agents was unable to finish the experiment, data for this agent was not used.

Materials

Adaptability Operations

To elicit adaptive behaviour in the agents, three tasks were created. As mentioned earlier, these tasks attempt to elicit adaptive behaviour by giving the agents an objective (i.e., a task the participant needs to accomplish), an expectation (i.e., some indication for what might happen during the mission), and then violating that expectation (i.e., the description of the event is inherently misguiding).

The secret note operation. The agent is instructed to retrieve a secret message from the office of a professor at the university (objective). It is made clear that the note will be present in one of the books inside of the office of the professor, and that the professor will have no problem with the agent borrowing the book, as the professor is not aware of the secret note (expectation). However, once the agents arrive at the office, it will turn out that the professor is away on a business trip, and that an assistant is present in the office. The assistant is not as willing to lend the book, because he/she does not own the book (expectancy violation).

The photo-evidence operation. The agent is instructed to obtain evidence of one of the employees at the university's involvement in criminal practices. The employee has been linked to a single office building involved in the crimes, in which he would be present. The agent is to acquire photographic evidence of the criminal employee being present in this office, to link him to the crime (objective). Instructions show that the agent would find the criminal employee present at the office and that a photo of this person can be made inconspicuously using a mobile phone (expectation). In reality, the criminal employee is ill, and a research assistant is present in the office. There is a picture of the employee on the wall

indicating that he should be present at the office. However, the research assistant is instructed that mobile phones and cameras are not allowed inside the room, which will make it more difficult for the agent to acquire the photo evidence (expectancy violation).

The fingerprints operation. The agent is instructed to obtain fingerprint material from a student advisor, as this person is suspected of committing fraud (objective). Fingerprints can be obtained by making the advisor hold a piece of paper with the agent's grades during a planned consultation meeting in which the agents play a student (expectation). However, when the agent enters the consultation room and converses with the student advisor, it will become clear that the student advisor will wear gloves when touching the paper (expectation violation).

Different operational orders. It should be noted that the agents would complete their three operations in one of three orders. This was done in order to counteract order effects: the agents possibly learn the experimental set-up after their first task, and could, thus, improve their results on subsequent tasks. In order to mitigate this effect, these different orders were implemented in the study. The three different orders were distributed evenly between all agents so that an equal number of agents would follow the same order. The tasks were labelled A, B, and C, and the different orders would be A>B>C, C>B>A, or B>A>C.

Environment. As for the research environment, six separate rooms were used. Three of these rooms had to accommodate for the agent and granters to fill in their between-and post-operations questionnaires, without the agents possibly being confronted with the granters they would encounter later in the experiment. The other three rooms were decorated to fit either:

- A professor's room. The books that the granter needed to sort were present and convincing of books that a professor would have.

- An employee room where planning would be done. A whiteboard with the employee that needed to be photographed was present.
- A meeting room where a student-advisor would normally meet students. Here, a box with protective latex gloves, as well as a box for used gloves was present.

Video equipment. To record the interactions between granter agent, GoPro Hero 5 Session, and GoPro 7 cameras were used. These cameras were used, as they were able to be placed inconspicuously inside of the room. Although participants were informed that they would be recorded, the cameras were hidden in the room as to keep the interaction more natural and help negate the Hawthorne effect, where individuals modify an aspect of their behaviour in response to their awareness of being observed (McCarney et al., 2007).

Between operations questionnaire agents. After each operation, agents filled in a questionnaire that measured adaptability (Martin et al., 2012; Collie & Martin, 2016), where they rated their ability to adapt their behaviour, cognition, and emotion. The questions asked in this questionnaire can be found in table 1 (appendix A). These questions were answered on a 7-point scale, with 1 meaning strongly disagree, and 7 meaning strongly agree. This adaptability scale showed an excellent reliability score of $\alpha = .92$. Furthermore, it was asked whether the agents managed to complete their objective, to determine success or failure, with success being coded as 1, while failure was coded as 0.

After operations questionnaire agents. After the three operations had been completed, agents filled in an after operations questionnaire. Here, the agents filled in several manipulation checks, to check whether the tasks required them to adapt their behaviour. The manipulation checks were answered on a 7-point scale, with 1 meaning no adjustment, and 7 meaning a lot of adjustment. The questions that were asked for the agents' manipulation checks can be found in table 3 (appendix B).

Furthermore, it was possible for the agents to describe their response regarding their cognition, emotions, and behaviour when their expectations were violated in open questions that asked to describe their thinking, behaviour, and emotional response to the specific events. This was done to obtain more info on cognitive, affective, and behavioral adaptability. The questions asked to the agents can be found in table 4 (appendix B).

After operations questionnaire granters. As granters only had one task, as opposed to the three tasks the agents had, it was only required to fill in an after operations questionnaire. For the granters, manipulation checks were also asked, as can be seen in table 5 (appendix B), to be answered on a 7-point scale, with 1 meaning either unmotivated or very easy, and 7 meaning either very motivated or very difficult, depending on the question. Furthermore, they were asked whether they allowed the agent to complete their objective via a yes/no/not sure question, in order to check for (accidental) goal completion. Next, granters were asked about their perception of the agents, to assess the agent's rated Ability, Benevolence, and Integrity. These questions are based on the three main factors that constitute trustworthiness, according to Mayer et al. (1995). For Ability and Integrity, six questions were asked to be answered on a 5-point scale, with 1 being 'strongly disagree' and 5 being 'strongly agree'. For Integrity, 4 questions were asked on a 5-point scale (Mayer et al., 2015). These questions can be found in table 2 (appendix A). The trust scale showed a good reliability score of $\alpha = .89$.

Procedure

Granters. The granters would arrive at intervals of ten minutes each session, with a total of three granters arriving in thirty minutes. These intervals were made to synchronise with the progress of the agents, who had to visit the three granters in order and fill in the between operations questionnaires. The granters were asked to read and sign the informed consent form. They were then given their instructions and were given time to adequately

prepare for their task. The granters then started to perform their task, which consisted of either book sorting for the professor that is on leave, working on planning in several employees for several tasks (both of which were made up by the researchers), or waiting for the student to arrive to start the student counselling. After being briefed and ready, the agent entered the room, and the granters would interact with the agent and either give in to their requests or resist, depending on how they interpreted their instructions. It is important to note that the granters were not instructed directly to cooperate or resist. Rather, the granters were given instructions and had to look for a solution to the situations themselves. After the interaction was over, the granter was escorted to the room where they had filled in the informed consent, in order to fill in the after operations questionnaire. Lastly, the granters were debriefed via a debrief document and debriefed verbally with the possibility to ask questions.

Agents. Participants in the agent role were sent to the room to complete their objective, which consisted of either obtaining the secret note, a picture of Lucas, or acquiring fingerprints. They were made to wait for 1 to 2 minutes before entering the room if the granter just entered, to make the occurrence seem more natural to the granter. Soon before the agent entered the room, a researcher would start the camera recording, so as to capture the full interaction. As soon as the agent entered the room, a timer would start to count up to 5 minutes, after which the operation would be brought to an end by one of the researchers entering the room and telling the participants to ‘wrap it up’. The video recording would be stopped by one of the researchers after this, with around a minute added before stopping the recording for finishing up the interaction between granter and agent, should this be required.

After the agent-granter interaction, both agent and granter were escorted to a separate room to complete their after operations questionnaire. For the agents, the after operations questionnaire was added after their last operation. If this was not their last operation, the

agent would be given the between-operations questionnaire corresponding with the operation they just completed. After the granter and agent filled in their after operations questionnaire, they were debriefed on paper and verbally.

Statistical Analyses

For the following analyses, IBM SPSS Statistics version 26 (IBM Corp., 2017) was used. To answer the research question, and give more insight into the relationship between adaptability, trustworthiness, and success on a task that requires adaptable behaviour, a mediation analysis was done using the PROCESS macro developed by Hayes (2017). It was chosen to use PROCESS, as this macro can create the interaction terms of the variables and centre them (Hayes, 2017), which aided the interpretation of the results. For a mediation analysis to be done, independent observations were required. This requirement was met by the set-up of the study, as one observation provided no information about the occurrence of the other observation. Next, various plots and the skewness and kurtosis values were considered in order to check for normal distribution of the variables. Lastly, scatterplots were used to determine whether the variables followed a linear pattern.

When doing mediation analysis (Preacher & Hayes, 2008), three steps are required to draw conclusions regarding the mediation. A significant relationship between the independent variable and the mediator (i.e. adaptability and trustworthiness) had to be established first. Secondly, the relationship between the mediator and the dependant variable (i.e. trustworthiness and success) had to be checked. For the last step, the non-significance of the relationship between the independent variable and the dependant variable in the presence of the mediator had to be shown, as this would indicate a full mediation (see figure 2). A 95% confidence interval regarding the indirect effect was considered after these three steps were conducted successfully. If this 95% confidence interval did not include zero, this would indicate a full mediation (Hayes, 2017).

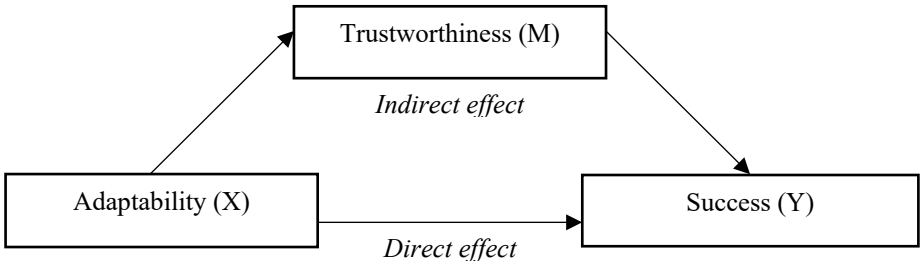

Figure 2. Expected mediation effect of trustworthiness on the adaptability-success relationship.

Results

Preliminary Analyses

The descriptive statistics for all variables can be found below, in Table 6.

Table 6

Descriptive statistics of all dependent and independent variables (M, SD, skewness, kurtosis)

	(n = 29)			
Variable	Mean	SD	Skewness	Kurtosis
Adaptability	3.42	.53	-.26	-.89
Trustworthiness	2.96	.37	-1.08	1.25
Success	.55	.27	-.12	-.31

After visually inspecting the Q-Q plots, boxplots, and histograms, a normal distribution could be assumed. The histograms (appendix C) showed a bell-shaped curve, indicating a normal distribution. Furthermore, the Q-Q plots (appendix D) indicated a deviation from normality that was acceptable. Skewness and kurtosis values did not exceed -1.00 and 1.00, which supported the assumption of normality. The variable of trustworthiness did, however, show a deviation from normality in the plot in figure 10 (appendix D), as well as by the kurtosis and skewness being respectively smaller than -1.00 and larger than 1.00.

This can be explained by the low outliers within the variable (appendix C). Nevertheless, results should be interpreted with caution.

Hypotheses Testing

To test all three of the hypotheses, a linear relationship had to be shown in the variables adaptability, trustworthiness, and success. There appeared to be a linear relationship between the variables, as can be seen in figures 8, 9 and 10 (appendix D). Furthermore, adaptability and success were normally distributed, as can be seen in the histograms in figures 5, 6, and 7 (appendix C) and the scatterplots in figures 11, 12 and 13 (appendix E).

For the first step of the mediation analysis, the regression of adaptability on the success of the agent was tested and found not to be significant, $b = .123$, $t(27) = 1.309$, $p = .202$. For the second step of the mediation process, the impact of adaptability on the rated trustworthiness of the agent, the mediator, was considered. This regression was found to be non-significant, $b = .020$, $t(27) = .152$, $p = .880$. As for the relationship between trustworthiness and the dependant variable of success, no significant relationship was found, $b = .051$, $t(27) = .366$, $p = .717$. For the last step of the mediation, the dependant variable was considered while controlling for the mediator. Hereby, adaptability was not a predictor of the amount of success when controlling for the rated trustworthiness [$b = .123$, $t(26) = 1.277$, $p = .213$]. As can be seen in these results in figure 3 below, none of the hypotheses have been confirmed.

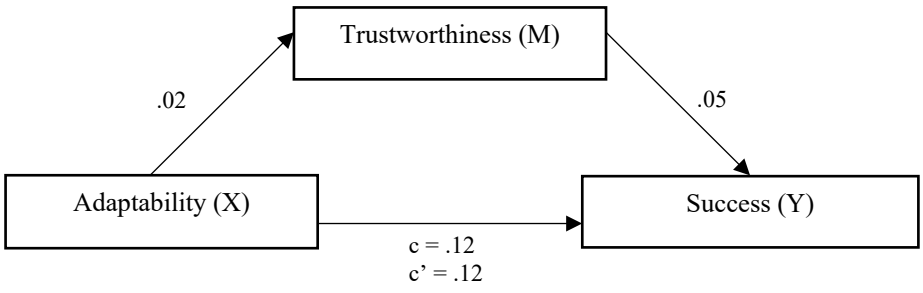

Figure 3. Mediation model between adaptability, trustworthiness, and success.

Exploratory Analysis

As no support was found for any of the predictions, additional exploratory analyses were conducted in order to provide for more information regarding the prediction of the different constructs in this research. Firstly, outliers were removed by examining the histograms and Q-Q plots and looking for extreme results. Secondly, the trust variable was split into cognitive and affective trust. Thirdly, adaptability was split into cognitive, behavioural, and affective adaptability. In doing so, it was attempted to find more information on the interaction of the different, now split, constructs. Lastly, in order to determine whether a specific mission order was better tailored to a specific type of adaptability, a one-sided ANOVA was done to test for order effects. As there were three different orders that the agents could take the operations in, it could be that this order influenced the way in which the agents adjusted to, and anticipated on, the operations, thus influencing the results on operations after the first operation. In order to check whether the three different orders that were implemented negated a possible order effect, a one-sided ANOVA was conducted.

Removal of Outliers. Two cases were excluded based on their relatively low trust scores, which can be seen in Figure 7 (appendix C) and figure 10 (appendix D). Although the outliers were not qualified for removal according to the $x_i > Q3+1.5*IQR$ or $x_i < Q1+1.5*IQR$ criterium (Moore, McCabe, & Craig, 2011), they were removed with the purpose of exploring whether the two outliers had any impact on the lack of results in the initial mediation analysis, as the two values were relatively close to the fence values that would qualify them for being outliers.

Separating Trustworthiness. The trustworthiness variable used in the analysis consisted of three different factors mentioned in Mayer et al. (1995): ability, benevolence, and integrity. Looking at Webber (2008), it can be seen that trust is divided into cognitive and affective trust. Mayer et al. (1995) suggest that the different factors that make up the

construct of perceived trustworthiness can be seen and analysed separately. Thus, it was attempted to divide trust into cognitive and affective trust. By separating these two constructs and analysing the constructs both as a mediator, it could be determined whether one of the constructs did have a higher mediating influence, compared to the other. To test this, the variable of trust was split into cognitive and affective trust, with cognitive trust consisting of the average of the scores on ability and integrity, and affective trust consisting of the average scores on benevolence. As for the two separate measurements, a good reliability score of α = .85 was found for both trust factors.

After these adjustments had been made for exploratory analysis, the same mediation analysis was conducted again, this time including both cognitive trust and affective trust as separate mediators. As for the first step of the mediation analysis, the regression of the combined cognitive, affective, and behavioural adaptability on the success of the agent was tested. Hypothesis 2 stated that higher adaptability scores will predict a higher success rate on the three operations. This relationship was not supported, b = .118, $t(26)$ = 1.295, p = .207. For the second step of the mediation process, the impact of adaptability on both the rated cognitive, as well as the rated affective trust of the agent, the mediators, were considered. Hypothesis 3 stated that adaptability scores will predict a higher trust rating from the granter about the agent. For cognitive trust, as well as affective trust, this relationship was not supported, with b = .027, t(26) = .217, p = .830 for cognitive trust, and b = .009, $t(26)$ = .049, p = .961 for affective trust. Hypothesis 1 stated that a higher rating on trust from the granter to the agent will predict a higher success rate on the three operations. For cognitive trust, as well as affective trust, this relationship was not supported, b = .359, $t(24)$ = 1.932, p = .064; b = -.237, $t(24)$ = -1.942, p = .064. For the last step of the mediation, the dependant variable was considered while controlling for the mediators. Hereby, adaptability was not a predictor

of the amount of success when controlling for the rated trust [b = .111, $t(26)$ = 1.269, p = .217].

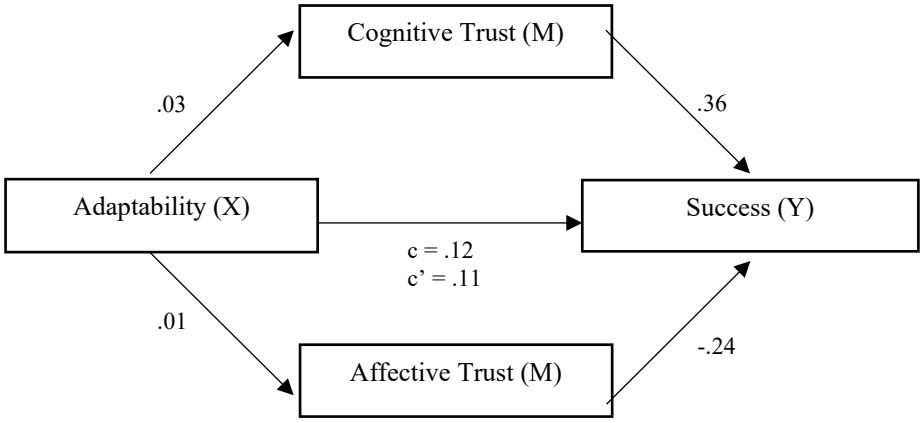

Figure 4. Mediation model between adaptability, Affective Trust, Cognitive trust, and success.

Separating Adaptability. As the analysis done on the now split trust provided contrasting results on the cognitive versus the affective factor, it was found meaningful to explore the data further, by splitting the adaptability construct into the three different factors it consists of. Thus, the mediation analysis that was performed earlier on adaptability was done again thrice, this time using the different factors of adaptability separated; cognitive, behavioural, and affective adaptability. As for the three separate measurements, an acceptable to good reliability score of respectively α = .77, α = .78, and α = .85 was found. As this split provided a lot of results, these results have been summarised in table 7, found below.

Table 7

Mediation Analyses after splitting adaptability

Regression	*B*	*t(df)*	*p*
Cognitive Adaptability > Success	.138	(26) = 1.695	.102
Cognitive Adaptability > Cognitive Trust	.031	(26) = .275	.785
Cognitive Adaptability > Affective Trust	.007	(26) = .041	.968

Cognitive Trust > Success	.351	(24) = 1.927	.066
Affective Trust > Success	-.233	(24) = -1.953	.063
Cognitive Adaptability > Success (controlling for mediators)	.129	(26) = 1.652	.122
Behavioural Adaptability > Success	.143	(26) = 1.847	.076
Behavioural Adaptability > Cognitive Trust	-.038	(26) = -.352	.728
Behavioural Adaptability > Affective Trust	-.100	(26) = -.609	.548
Cognitive Trust > Success	.366	(24) = 2.034	.053
Affective Trust > Success	-.220	(24) = -1.851	.077
Behavioural Adaptability > Success (controlling for mediators)	.135	(26) = 1.815	.082
Affective Adaptability > Success	.002	(26) = .024	.981
Affective Adaptability > Cognitive Trust	.062	(26) = .617	.543
Affective Adaptability > Affective Trust	.100	(26) = .653	.519
Cognitive Trust > Success	.370	(24) = 1.928	.066
Affective Trust > Success	-.241	(24) = -1.910	.068
Affective Adaptability > Success (controlling for mediators)	.003	(26) = .040	.968

Testing for order effects. To examine whether there were order effects for the three different orders in which the operations took place, a one-way between-subjects ANOVA was conducted to compare the effect of the order on average adaptability and average trust for operation order A, B, and C. There was no significant effect of the order on neither

adaptability nor trust at the $p < .05$ level for the three conditions [$F(2, 25) = 9.42$, $p = .403$; $F(2,25) = 3.358$, $p = .051$].

Discussion

This research aimed to investigate the relationship between adaptability, trustworthiness, and success on a task that required adaptability. It was expected that higher adaptability would lead to higher success, and that trustworthiness mediated this relationship by being positively influenced by adaptability and having a positive influence on success. As none of these effects were found, the lack of these findings will be discussed below.

Main Findings

Firstly, the hypothesised relationship between adaptability and success was not found to be significant. This is not in line with the works of Love (1990), Girodo (1997), and Picano and Roland (2012), which all speculated that adaptable behaviour and adaptive ability contribute to successful results in a law-enforcement setting. The tasks in this research were designed in such a manner as to elicit adaptive responses by the agent, and in utilising this adaptive behaviour, it was expected that agents would find more success on their tasks than agents who did not show adaptive behaviour. This, however, did not show itself in the results.

Secondly, as for the relation of the agent's rated adaptability and trustworthiness, no significant results were found in the initial research. This was not in line with expectations, as it was expected that higher rated adaptability would lead to higher trustworthiness. With respect to the relationship between trustworthiness and success, again, no significant results were found. As it was expected that a higher rated trust would predict a higher success rate, this result was not in line with the hypothesis.

The lack of findings could be attributed to the low power of the results, or to the fact that self-rated questionnaires were used to measure adaptability. The relatively low number of respondents, coupled with the biases that self-rated questionnaires bring with them, could

have contributed to the insignificant results. Social desirability bias could have contributed to respondents rating themselves higher on adaptability (Krumpal, 2011), while other influences such as mood could cause lower scores when participants felt bad for not reaching one or more of the objectives (Garcia & Gustavson, 1997).

Explorative Findings

As none of the results found in the initial research were significant, additional explanations for these insignificant results were investigated. As both adaptability and trustworthiness were constructs that consisted of multiple factors, these factors were used in the mediation analysis instead of the full constructs. Although still not providing significant results, the exploratory analyses did show some interesting results.

Behavioural Adaptability. Although the relationship between behavioural adaptability and success was not significant, it could be speculated that, in the operations created within this research, behavioural adaptability played a more important role in the success of the agents, as behavioural adaptability concerns itself more with practical action (e.g. seeking out new information or useful resources; Schulz & Heckhausen, 1996), which was largely required in the three operations. However, as this is an explorative study, more research should be done on this possibility.

Splitting Trustworthiness. After splitting trustworthiness into cognitive trust and affective trust, there was an interesting finding, which could explain the insignificant results on the relationship between trustworthiness and success. Affective trust showed a negative relationship with all three success ratings. The insignificance of the relationship of trust, both affective and cognitive, could also indicate that trustworthiness does not play the role that was hypothesised. It is possible that the tasks created did not require the trust that was hypothesised and, thus, the relationship between trustworthiness and success did not manifest itself. As mentioned earlier, agents could complete their objectives in a more direct manner,

causing the need for trust to diminish. Furthermore, when looking at the video material a general trend of the agents insisting on acquiring their objective, to the annoyance of the granters, is seen. The agents that insisted did, overall, attain more success than the agents that gave up after a failed attempt, possibly explaining the relationship between affective trust and success being insignificant but having a negative tendency. It would be interesting to explore the possibility of a negative relationship between affective trust and success on a short-term task that requires adaptive behaviour in future research, as this has not yet been done.

Limitations

One of the limitations of this study is the limited sample size. As every session required three granters and one agent to provide one sample that could be used for analyses, a large number of participants was needed. However, as the research was taking place, the outbreak of the Covid-19 pandemic halted the progress that was being made. As a result, the relatively small number of participants caused the analyses to have low power. This could have contributed to results that did not demonstrate the hypothesised effects. For example, it could have been possible that this study contained a sample with a relatively high or low propensity to trust (Mayer et al., 1995) by chance, biasing the results obtained. Thus, although this research provides some interesting results, they are to be interpreted with caution.

Additionally, this study involves self-rated questionnaires on adaptability. This leaves the results vulnerable to being influenced by social desirability bias (Krumpal, 2011) or the mood of the agents (Garcia & Gustavson, 1997). The agents could rate their adaptability higher, assuming this would be desirable, or lower, should they be in a bad mood after not obtaining a desirable result.

Furthermore, a scale was made to measure trustworthiness, based on existing literature on the topic by Mayer and Davis (1999), and Colquitt, Scott, and LePine (2007). As

some of the questions did not fit with the operations created. For example, the question 'The trustee's actions and behaviors are not very consistent', was not included in our trust scale, as it was expected that the short-term nature of the operation made this question obsolete. In hindsight, this could have resulted in missing relevant items within our trustworthiness test. As the measurement of trustworthiness in an undercover operations setting has not yet been conducted, it could be argued that implementing a test with more questions would be beneficial, in order to measure as broad as possible and improve content validity.

Implications and Future Research

Even though the results found in this research did not line up with expectations, this work does bring to light some interesting findings on the relationship between adaptability and trustworthiness and opens up a range of possibilities for researching how the various factors that constitute adaptability and trustworthiness relate. Being aware of how these different factors shape adaptability and trustworthiness is not only advantageous in the field of legal psychology but is a valuable contribution to other psychology domains as well, providing input that facilitates novel research. For example, by better understanding the different factors of adaptability, this knowledge can be utilised in researching mental wellbeing.

These results in particular show that adaptability and how it interacts with other factors such as trustworthiness and success on a short-term undercover task interacts differently than adaptability in the context of education or other important life events. This is an important finding that can be used in follow-up research on adaptability in covert operations, as it shows that a different focus could be required in the domain of undercover work. Future research could reconsider whether the different factors within adaptability are suitable for undercover operations, and possibly alter the composition of the adaptability construct to fit better with undercover operations. This study, furthermore, puts into question

whether self-rated adaptability is an accurate measure when it concerns covert operations like the operations done in this study. In future research, this could be considered, and other ways of measuring adaptability could be used, possibly improving the measurement of adaptive skill in undercover operatives. For example, the adaptability of the agent could be rated by the researcher when examining the video and audio material, eliminating self-reporting bias.

From a practical standpoint, this research furthermore offers useful findings, as police units in various countries could benefit from being able to systemically analyse adaptive skill in (prospective) police officers. Although no such analysis is possible as of yet, this research provides a starting point for its development, as this research provides insight into the measurement of adaptability within covert operations. So far, police units in The Netherlands and Los Angeles have expressed their interest in doing so, which shows promise of implementing the findings done in this research into practice. Being able to measure adaptive skill, and the trustworthiness that this skill can facilitate could be used in law-enforcement personnel selection, as well as the training of this personnel. The framework created in this research, with an objective, expectation, and violation of this expectation, can be used in a similar way for training or selection of undercover operatives within police units. As a result of increased knowledge on adaptability, and especially the relationship between cognitive/affective trust, adaptability, and success in (prospective) undercover operatives, their training can be improved with the aim of developing adaptive behaviour, resulting, hopefully, in increased effectiveness of undercover operations. Similarly, by measuring adaptability in prospective undercover operatives, selection can be made more effective by enabling the selection of prospects who score higher on adaptability. This would be useful, should a positive relationship between adaptability and success on an undercover task be found in future research.

With regard to follow-up research, the current study provides a good starting point. The results give rise to the concept of different factors in adaptability and trustworthiness interacting with each other in different ways in covert operations, compared to other situations that require adaptability, such as education and adolescent development. Results suggest that, although not significant, it is possible that there is a negative relationship between rated cognitive and affective trustworthiness and success on a covert task that requires adaptability. Whether this is due to the type of covert operation could be studied further in follow-up research, but this finding does suggest that a different focus could be used in future research. It points towards the rated cognitive and affective trustworthiness playing a different role in the success of undercover operations, which could be explored further.

Conclusion

This study examined the influence of adaptability on trustworthiness and goal achievement on an undercover task that requires adaptive behaviour, with the use of a newly developed framework for investigating adaptability. Here, participants were given an objective, an expectation, and, lastly, the expectation that was created was violated in order to facilitate adaptive behaviour. Providing a new framework to study adaptability, this research contributes on a practical level, providing a framework that enables law enforcement to improve their training- and selection procedures by being able to measure adaptability. Furthermore, by providing a framework for measuring adaptability, a valuable contribution is made in fields outside of legal psychology, as being able to measure adaptability can be used to help individuals in developmental/educational psychology. Within these domains, the new framework facilitates novel researches on the influence of adaptability in human development and education. Although no significant results were found, this research provides interesting avenues for future research. This study suggests the absence of a relationship between

trustworthiness, adaptability, and operational success in an undercover operation. As this study suggests a negative relationship between cognitive/affective rated trustworthiness and success on an undercover operation, this possible relationship could be investigated more thoroughly in a study more focussed on the relationship between rated trustworthiness and success on covert operations.

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Appendices

Appendix A

Table 1

Between operations questionnaire for the agents showing three types of adjustment

Type of adjustment	Questions
Cognitive	I was able to think through a number of possible options to assist me when I realized the professor would not be present. I was able to revise the way I was thinking (when I realized the professor would not be present) which helped me through it. I was able to adjust my thinking or expectations to assist me in the interaction with the assistant when it was necessary.
Behavioural	I was able to seek out new information or useful resources to effectively deal with the assistant (rather than the professor). When dealing with the assistant, I was able to develop new ways of going about things (e.g. a different way of doing something or finding information) to help me through. To assist me in dealing with the assistant, I was able to change the way I wanted to do things when it was necessary.
Emotional	During the operation, I was able to reduce negative emotions (e.g., social anxiety, feeling awkward) to help me deal with the fact that the professor would not be present. When I realized the professor would not be present, I was able to minimize frustration or irritation so that I could deal with it best.

	To help me through the interaction with the assistant, I was able to draw on positive feelings and emotions (e.g., enjoyment, satisfaction).

Table 2

Trust questions based on Mayer et al. (1995)

Factor of trustworthiness	Questions
Ability	- [agent] was very skilled at getting me to agree to his/her request. - I think that [agent] was experienced in getting his/her behavior approved by others. - I expect that [agent] would be known to be successful at the things she/he tries to do. - Given my experience with [agent], I see no reason to doubt his/her competence. - I feel very confident about [agent] skills. - I think that [agent] has specialized capabilities that can increase the performance of the people around [agent].
Benevolence	- I think I would be able to talk freely to [agent] and know that [agent] would want to listen. - If I shared my problems with [agent], I believe [agent] would respond constructively and caringly. - I believe that [agent] would go out of his/her way to help me. - I believe my needs and desires were very important to [agent].

	- I believe [agent] would not knowingly do anything to hurt me. - I think [agent] would really look out for what is important to me.
Integrity	- I believe [agent] tries hard to be fair in dealing with others. - I think I would appreciate [agent's]values and principles. - I believe [agent] has a strong sense of justice. - I believe [agent] is the type of person who sticks to their word.

Appendix B

Table 3

Manipulation check questions for the agents

Questions
Did you perceive that you had to adjust your behavior to complete your objective in operation 1?
Did you adjust your behavior in operation 1?
How motivated were you to complete your objective in operation 2 (collect the fingerprints)?
Did you perceive that you had to adjust your behavior to complete your objective in operation 2?
Did you adjust your behavior in operation 2?
How motivated were you to complete your objective in operation 3 (take a picture of Lucas)?
How motivated were you to complete your objective in operation 3 (take a picture of Lucas)?
Did you perceive that you had to adjust your behavior if to complete your objective in operation 3?
Did you adjust your behavior in operation 3?

Table 4

Open questions regarding the task experience, answered by the granters

Category	Questions
I) Your thinking	Please describe, in as much detail as possible, how you responded mentally (i.e., thoughts in your head) to the specific events (e.g., thinking through a number of options; experiencing a brain freeze; wanting to escape the situation). Please answer both a) and b) questions below. a) Describe how your thinking was similar in all three events. Operation 1: When you understood that the professor would not be present. Operation 2: When you understood that the consultant would put on gloves. Operation 3: When you understood that it was prohibited to take pictures in the lab. b) Describe how your thinking was specific or unique to an event. Operation 1: The secret note When you understood that the professor would not be present. Operation 2: The fingerprints When you understood that the consultant would put on gloves. Operation 3: The photograph When you understood that it was prohibited to take pictures in the lab.

II) Your behavior:	Please describe, in as much detail as possible, how you responded behaviorally to the specific events (e.g., started looking for new information that might be helpful; made efforts to buy more time; tried to control impulsive behavior). Please answer both a) and b) questions below. a) Describe how your behavioral response was similar in all three events. Operation 1: When you understood that the professor would not be present. Operation 2: When you understood that the consultant would put on gloves. Operation 3: When you understood that it was prohibited to take pictures in the lab. b) Describe how your behavioral response was specific or unique to an event? Operation 1: The secret note When you understood that the professor would not be present. Operation 2: The fingerprints When you understood that the consultant would put on gloves. Operation 3: The photograph When you understood that it was prohibited to take pictures in the lab.
III) Your emotions:	Please describe, in as much detail as possible, how you responded emotionally to the specific events listed above (e.g., started to feel very awkward; was able to minimize frustration; drew on positive feelings to help me through). Please answer both a) and b) questions below.

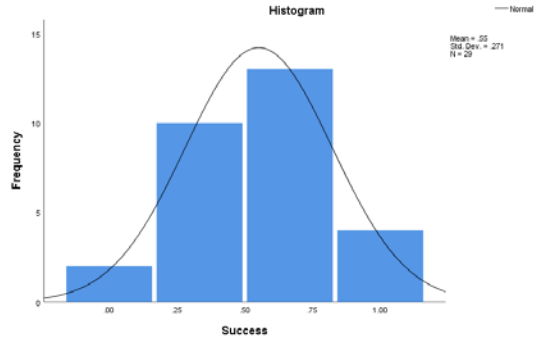
a) Describe how your emotional response was similar in all three events.
Operation 1: When you understood that the professor would not be present.
Operation 2: When you understood that the consultant would put on gloves.
Operation 3: When you understood that it was prohibited to take pictures in the lab.
b) Describe how your emotional response was specific or unique to each event.
Operation 1: The secret note
When you understood that the professor would not be present.
Operation 2: The fingerprints
When you understood that the consultant would put on gloves.
Operation 3: The photograph When you understood that it was prohibited to take pictures in the lab.

Table 5

Manipulation check questions for the granters

Questions
How motivated were you to do your job during your “day at work”?
How easy/difficult was it for you to take your role as a “new employee” seriously?
How easy/difficult was it for you to take your “day at work” seriously?

Appendix C



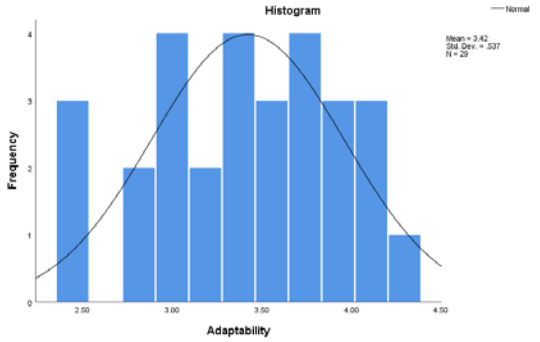


Figure 5 + 6. Histograms of the variables success and adaptability.

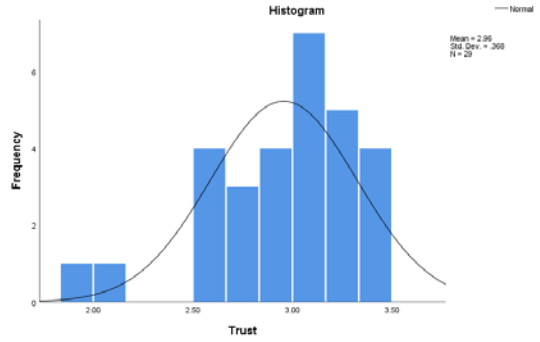
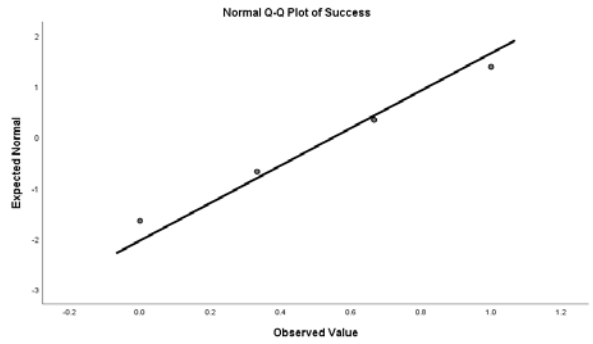


Figure 7. Histogram of the variable trust.

Appendix D



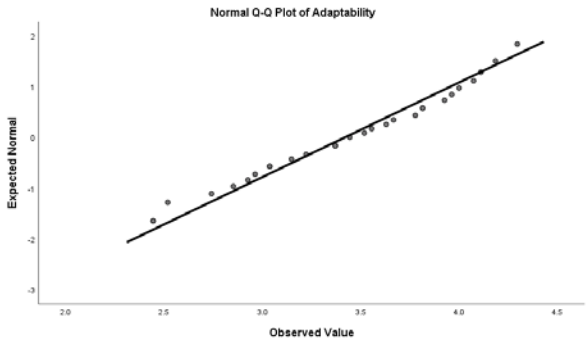


Figure 8 + 9. Normal Q-Q plots of the variables success and adaptability.

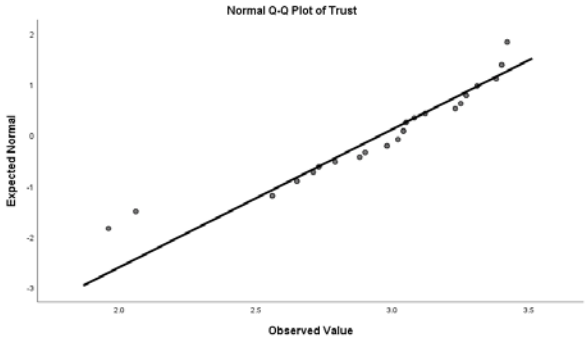


Figure 10. Normal Q-Q plot of the variable trust.

Appendix E

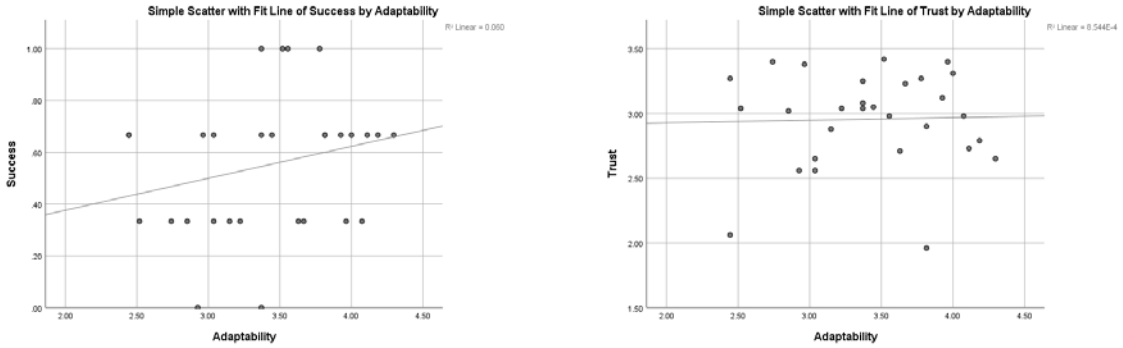


Figure 11+12. Scatterplot to demonstrate linearity between adaptability and trust, and adaptability and success.

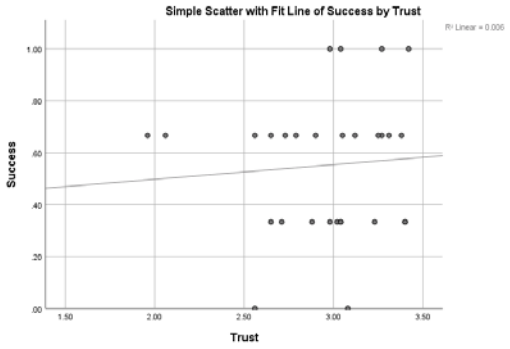


Figure 13. Scatterplot to demonstrate linearity between trust and success.