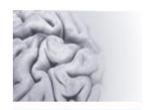# Is empathy always a good thing?

An experimental study on the mechanisms of empathy
during task completion

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Abstract

Empathy is fundamental to caring and enhances the therapeutic potential of a physician-patient relationship (Larson & Yao, 2005; Mercer & Reynolds, 2002). However, when physicians experience high levels of empathy, they may become overly emotionally involved with their patients and this has the potential to interfere with the relationship in a deleterious manner (Eisenberg et al., 1994). The present study investigated whether having feelings of empathy was beneficially or disadvantageously related to task completion. In addition, we investigated whether levels of anxiety are related to task completion as well. The present study used a 2 (cognitive load / no cognitive load) by 2 (high levels of empathy / low levels of empathy) between-subjects design. Participants carried out a motor task in order to measure performance and task improvement. Empathy did not seem to affect task performance and no relationship was found between anxiety and task completion.

Is empathy always a good thing?

An experimental study on the mechanisms of empathy during task completion

When people feel bad, sad, or are in pain, mentally or physically, they presumably experience a need for support from another person. Supporting people is an example of prosocial voluntary behavior with benefits for another person where the motive is unspecified, and may be negative, positive, or both (Eisenberg & Miller, 1987). In addition, supporting people involves an emotional response to another, which can be described as empathic responding. Therefore, empathic responding is involved in prosocial behavior (Eisenberg & Miller, 1987). In the broadest sense, empathy refers to the reactions of an individual to the observed experiences of another (Davis, 1983). However, these reactions depend on individual differences and situations to determine whether having feelings of empathy will be beneficial or disadvantageous (Davis, 1980).

For example, the role of empathy is complex in medical situations, especially in physician-patient relationships (Larson & Yao, 2005). Larson and Yao (2005) explored the importance of empathy for health care professions, and showed that physicians who display a friendly, warm, and reassuring manner with their patients, during consultations, are more effective. In addition, empathic responding makes patients more forthcoming about their concerns. Therefore, empathy is fundamental to caring and enhancing the therapeutic potential of a physician-patient relationship (Larson & Yao, 2005). Marcus (1999) explains that sharing the feelings of ill people is difficult because there is a difference between our experiences of ourselves as doctors and healthy persons on the one hand, and our experiences of ill people who are sick on the other. Marcus (1999) refers to a semi-permeable barrier which is required to share the feelings of ill people. Too impermeable a barrier threatens our

ability to know what a patient feels and experience our common humanity (Marcus, 1999). When physicians experience high levels of empathy they may become overly emotionally involved with their patients, which can potentially interfere with the physician-patient relationship in a deleterious manner. In addition, the relationship may also interfere with treatments like surgery, which can cause serious negative consequences. Because surgery is task-related (Motowdilo & Scotter, 1994), the mechanisms of empathy may work differently compared to consultations. In this study tasks are defined in terms of behavioral and cognitive responses a person should carry out in order to achieve some specified level of performance (Wood, 1986). However, there is still no clear answer as to whether having feelings of empathy may be disadvantageously related to surgeries.

Other studies have also explored the role of empathy in medical contexts, however none of these studies have evaluated the specific role of empathy in different medical situations (Fine & Therrien, 1977; Levinson & Chaumeton, 1999; Loewenstein, 2005). Eisenberg et al. (1994) explored the role of individual differences in emotionality and regulation in empathy-related responding. For example, if an individual is prone to intense emotions, but not well regulated, he or she is expected to be biased to experience overall arousal and, therefore, personal distress. Feelings of personal distress may influence task completion in a disadvantageous manner (Eisenberg et al., 1994). Therefore, the present study investigates whether having feelings of empathy is beneficially or disadvantageously related to task completion. In addition, there is a relationship between anxiety and empathy which found increased levels of anxiety during empathic responding (Davis, 1980; Eysenck & Eysenck, 1985). Anxiety may also influence individual attributions and is an important factor for understanding adult interpersonal behavior and

psychological adjustment. Understanding interpersonal behavior is related to empathy (Loudin, Loukas & Robinson, 2003). Accordingly, the present study also investigates whether levels of anxiety are related to task performance.

Feelings of empathy in consultations and surgery

Tait, Chibnall, Luebbert, and Sutter (2005) studied the effect of conservative and surgical treatment, success or failure, on attributions by surgeons for low chronic back-pain patients' surgical outcomes, with empathy as a moderator of these attributes. The psychological studies outlined several dimensions along which causal attributions may vary with respect to unsuccessful and successful outcomes. Therefore, from the physician's perspective, a treatment success could be attributed to characteristics of the physician, the patient, and other factors. The same remains for unsuccessful treatment (Tait et al., 2005). Empathy may influence the causal attribution process. The study conducted by Tait et al. (2005) concluded that empathic surgeons were less likely to see the failed surgery patient as psychologically culpable. There are several reasons why feelings of empathy are important in consultations; physicians and patients exchange personal information, develop important trusting relationships, and discuss treatment options. Effective communication between physicians and patients enhances satisfaction, psychological well-being, and biomedical outcomes (Levinson & Chaumeton, 1999). However, the physicians-patient relationship comprises more than consultations. Surgical treatments are also an important part of medical procedures, and compared to consultations between physicians and patients, surgeries are more task-related (Motowdilo & Scotter, 1994).

Individual differences related to empathy

Davis (1980) developed an individual difference measure of empathy, the Interpersonal Reactivity Index, which consists of four subscales, each tapping into

aspects of the global concept of empathy (Davis, 1980). The perspective taking (PT) scale implies the tendency to spontaneously adopt psychological points of view of others. The fantasy (FS) scale refers to the opportunity to transpose oneself imaginatively into the actions and feelings of fictitious characters in books, plays, and movies. The empathic concern (EC) scale refers to other oriented feelings of concern for unfortunate others and sympathy, and the personal distress (PD) scale consists of self-oriented feelings of personal anxiety (Davis, 1980). One of the findings was the positive association between high empathic concern (EC) scores and anxiety. Another important finding was the strong association between the personal distress (PD) scores and lower self-esteem, specifically poor interpersonal functioning, social anxiety, and shyness (Davis, 1980). According to the IRI, personal characteristics can be distinguished, which might be beneficial or disadvantageous for feelings of empathy.

Marcus (1999) studied the professional development of medical students, highlighting the potential harmful effect of empathy in a medical context. Therefore, Marcus (1999) distinguished four stages during the medical study. The first stage, which entails the first year of medical study, refers to the empathic identity in which medical students feel the patient's emotions as if they were their own. Therefore, their self-imposed workload and work anxiety increased during the first year of medical study. The second stage, which entails the second year of medical study, describes empathic dis-identity of the students. In this phase, students have more difficulty understanding what the patient feels, and no longer think they empathize with their patients. The third stage, the third year of medical study, refers to rigid craft-identity, in which students identify themselves as an ideal healthy doctor who they evaluate as invulnerable, skillful, effective, and calm. Stage four, the final year of medical study,

contains patient-centered craft-identity. Early experiences of failure ease into a more mature craft-guild experience and therefore the students no longer feel that their self-esteem is constantly threatened (Marcus, 1999). In the fourth stage, students are more realistic, flexible, and patient-adapted, meaning they experience feelings of empathy and try to understand their patients, but no longer feel threatened by their self-esteem, and are not overly emotionally involved with their patients. Although it seems that students in stage four reach their goals completely and become professional doctors, not all the students reach this stage. Therefore, students who experience empathy still feel the patient's emotions as if they were their own (Marcus, 1999). This experience of empathy may be disadvantageous during surgeries.

Whereas Marcus (1999) provides educational implications, other research examine the problems of miscommunication between physicians and patients, and the dis-identity of physicians towards patients (Rudebeck 2000; Loewenstein 2005). Rudebeck (2000) discusses the problem with clinical interaction between the physicians and the patients, explaining that the physicians know all about the illnesses, but he or she does not understand the patient. Conversely, the patient has the illness, but does not understand the physician.

Another important finding in the literature explains that the better the physician's comprehension fits with the actual experience, the more likely it is that the diagnostic judgment will be accurate (Rudebeck, 2000). Supporting evidence for the importance of empathy in a medical context is described in a study by Fine and Therrien (1977), in which they designed a training program intended to help medical students develop empathic responding towards patients. This training was meant to facilitate initial rapport where interpersonal skill training was offered for weekly sessions (Fine & Therrien, 1977). Fine and Therrien (1977) showed that students

whom received the training were more able to attend empathically to the patient with a medical problem.

Anxiety and task related performances

The characteristics of the physician can also influence feelings of empathy. Anxiety is an important trait that is related to empathy (Marcus, 1999; Davis, 1980). Marcus (1999) explains that students who feel the emotions of a patient as if the emotions were their own, experience increased self-imposed workload and work anxiety. Davis (1980) found a positive association between high empathic concern (EC) scores and anxiety. In addition, Eysenck and Eysenck (1985) refer to their finding that feelings of anxiety or fear enable the ability of feeling the emotional state of other's as if the emotions were their own. Barrio, Aluja, and García (2004) found an association, both positive and negative, between empathy and neuroticism. Barrio, Aluja, and García (2004) define neuroticism as a 'negative emotionality state' such as anxiety, low mood, vulnerability, and hostility. Loudin, Loukas, and Robinson (2003) found that anxiety is an important factor for understanding adult interpersonal behavior and psychological adjustment. Understanding interpersonal behavior is an example of empathic responding (Loudin, Loukas & Robinson, 2003). This research suggests that feelings of anxiety will influence feelings of empathy, or are related to feelings of empathy.

Present Study

The current study investigates whether feelings of empathy are disadvantageous during task-related performance. Empathy as an independent variable was manipulated to measure the difference between the experimental and the control group. Participants carried out a motor task, and their improvement was measured. This motor task consisted of stitching a fake arm. Whether the participants

improved during the task was measured by the number of stitches, the time taken to stitch the wounds, and the gaps between the stitches. We predict that having feelings of empathy would be disadvantageous during task completion, and therefore reduce performance. As aforementioned, feelings of empathy can cause personal distress which may influence task completion in a disadvantageous manner (Eisenberg et al,. 1994). Because surgery is task-related, it was expected that empathic responding (as a physician) would have potentially negative consequences during the task. Based on these assumptions, the following hypothesis was proposed: *H1a*: Participants with empathic feelings will not improve their performance during the stitching task.*H1b:* Participants without empathic feelings will improve their performance during the stitching task.

As described in previous studies, feelings of anxiety are related to feelings of empathy, and the consequences of experiencing feelings of anxiety are partially similar to the consequences of experiencing feelings of empathy, as both characteristics causes the ability to feel another's emotional state (Eysenck & Eysenck, 1985). Therefore, physicians may be overly emotionally involved with their patients and would not improve during the stitching task. Based on these assumptions, the following hypothesis was proposed: *H2:* High levels of anxiety are related to bad performance on the stitching task, this relation is stronger in the high empathy group compared to the low empathy group.

Method

Participants and design

Data came from 71 students from the University of Leiden (48 females) and (23 males) (*M*age= 21.96, *SD*age=2.27). Students were recruited from the University of Leiden via flyers or posters. The present study used a 2 (cognitive load / no

cognitive load) by 2 (high levels of empathy / low levels of empathy) between-subjects design. Participants were randomly assigned to one of these four conditions. The experimental group represented participants who experienced high levels of empathy, and the control group represented participants who experienced low levels of empathy. The independent variable was empathy and the dependent variable was task performance, which represented good or bad task completion. Levels of anxiety were measured to investigate whether anxiety was related to task performance, and whether this relationship differs between the conditions.

Materials

Empathy. Empathy was manipulated through 14 stressful and disturbing pictures representing people in need or pain. These pictures have been successfully used in order to manipulate empathy in a previous study conducted by Batson, Early and, Salvarani (1997).

Task performance. To measure task performance we used a fake arm, like those typically used by medical students to practice stitching wounds. Participants stitched three wounds on the fake arm. Before the experiment, participants did not practice stitching.   `

Anxiety. The State Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983) was used to measure levels of anxiety. The STAI measured the participant's anxiety levels experienced at that moment (State Anxiety), or anxiety commonly experienced on a day-by-day basis (Trait Anxiety). Trait anxiety was used to measure levels of anxiety, and was measured by 20 items on a 4-point scale (1= *almost never*, 4= *almost always*). An example of a trait question was: "I worry too much over something that really does not matter". The reliability of the STAI is good with a Cronbach's alpha of .86 (Quek, Low, Razack, Loh, Chua, 2004).

Cognitive load. A five minute Tetris game on a computer was used to measure cognitive levels. After participants watched the stressful and disturbing pictures used to manipulate empathy, they played Tetris or were requested to do nothing and wait in the cubicle. This material was used for a different study and is not discussed further in the present study.

Reading the mind in the eye test. The 'reading the mind in the eyes' test developed by Simon Baron-Cohen, is an advanced test of theory of mind, and is used to assess individual differences in emotion recognition, social cognition, and affective empathy across different groups and cultures. The revised version for adults was used in the present study and consisted of 36 pictures representing different sets of eyes (Baron-Cohen, Wheelright, Hill, Raste & Plumb, 2001). Participants were required to determine the most suitable emotion represented in the picture, choosing from four possible answers displayed in a multiple-choice format. For example, 'irritated, anxious, hostile, or happy'. The internal consistency (Cronbach's alpha) of the test is .61, with a maximum weighted internal consistency of .72, and test-retest reliability of .63 (95% confidence interval). This material was used for a different study and is not discussed further in the present study.

Manipulation check. There was an inconsistency in the data due to problems translating the questionnaires, which were obtained by the online survey tool Qualtrics, into hand written data. Therefore, we were not able to compute the manipulation check.

Procedure

Participants completed an informed consent form, and were told the study measured emotions and cognition. After they signed the informed consent form, they took a seat in a cubicle behind a computer. Participants were requested to look at 14

disturbing pictures of persons in stressful situations. Each picture was displayed for three seconds, and immediately followed by the next picture. The instructions for the experimental group were: W*hile looking at the pictures, try to focus as much as you can. It is important to empathize as much as you can and try to feel what the person feels on the pictures.* The instructions for the control group were: *While looking at the pictures, it is important to look as objective and detached as possible. Do not try to give any meaning to the pictures.* The experimenter remained in the cubicle while the participant observed the pictures.

After the slideshow, participants played Tetris on the computer for five minutes, or were requested to do nothing and wait in the cubicle for five minutes. Participants who played Tetris were asked if they were familiar with this game, and in the cases in which they were not, the experimenter provided instructions. In cases of the game ending before five minutes, the participants were requested to restart the game. Participants who did not play Tetris were requested to do nothing but sit on their chair for five minutes. In both cases, the experimenter left the room and returned after five minutes to continue the study.

After viewing the pictures and either playing Tetris or doing nothing for five minutes, participants commenced the stitching task. Needles, and real suture filament were used to stitch the wounds on a fake arm. We requested that participants pay attention to two criteria: that the space between the stitches should be as small as possible, and at the same time, the number of stitches should be minimized. In addition, we requested that participants find a good balance between the number of stitches and the space between the stitches. The experimenter explained the stitching technique to the participants to ensure every participant used the same stitching style. The experimenter told the participants to give a sign when they had finished stitching

the first wound. After the participants had finished stitching each wound, the experimenter entered the cubicle to track the time taken to complete the task and to determine whether the stitching technique had been applied correctly. After the participant had stitched all three wounds, the experimenter returned to the cubicle to continue the study.

Finally, participants completed a questionnaire that comprised the 'reading the mind in the eyes', the STAI, and demographic questions about themselves. At completion of the experiment, the experimenter asked the participants some questions to ensure the participant was not psychologically harmed, and explained the aim of the study. If a participant had questions about the study, the experimenter answered as completely as possible. Participants were then debriefed, rewarded, and thanked.

Data analysis strategy

Data obtained by the online survey tool Qualtrics were uploaded to Statistical Package for Social Sciences (22.0) in order to analyze the data. To test the hypothesis of the present study, we conducted an independent samples *t*-test to investigate whether the two group means differ on task performance. In addition, we applied Person correlation to measure the correlation between anxiety and task performance.

To measure task performance, the number of stitches, the distance between the stitches, and time taken to complete the task, were measured to estimate whether performance on the task was reduced. To operationalize task performance, two different measurements were applied; time required for each wound, and task efficiency. Time required for stitching each wound was divided by the number of stitches for each wound, and this number represented time the participant required mending each wound. The higher this number, the worse the participant performance on the task. To measure task efficiency, time was divided by the standard deviation of

the distance between each stitch for each wound. The higher this number, the more efficient performance was for the stitching task, and the better the improvement. This improvement represented the speed participants stitched the wounds, and the consistency of the gaps between the stitches.

For both measurements, an index of improvement was calculated by computing the slope of the line between the three stitching wounds. Therefore, for each participant and each measurement, one number represented the performance of task completion.

Results

Performance on the stitching task

To measure task performance, two slopes were calculated as an index of improvement. The first measurement represented the improvement of time required stitching the three wounds. The results indicate that there was no significant effect of empathy on improved task performance $t (69) = -1.80$, $p = .86$. Thus, H1a and H2b were not supported. The mean scores, the standard deviations, and the standard error are listed in Table 1.

Table 1.

Means and standard deviations for performance on the stitching task measured by time of the stitches divided by the number of stitches.

Condition	N	Mean	SD	SE
Low empathy	35	-.49	5.04	.85
High empathy	36	-.04	13.92	2.32

For the second measure of task performance, we measured task efficiency, and for

each wound, time was divided by the standard deviation of the distance of each stitch.

The higher this number, the more efficient performance was on the stitching task, and

the better the participant's improvement. This improvement represented the speed

participants stitched the wounds, and the consistency of the gaps between the stitches.

Results indicate that there was no significant effect of empathy on task performance t

$(69) = -.34$, $p =.74$. Thus, H1a and H1b were not supported. The mean scores, the

standard deviations and the standard error are listed in Table 2.

Table 2.

Means and standard deviations for performance on the stitching task

measured by time of the stitches divided by SD distance of the stitches.

Condition	N	Mean	SD	SE
Low empathy	35	-.02	.24	.04
High empathy	36	-.00	.41	.07

The relationship between anxiety and the performance on the stitching task

To measure whether a relationship between task performance and anxiety was

present, scores of the STAI questionnaire were examined. No correlation between

anxiety and task performance was found (time divided by number) in the control

group (low levels of empathy), $r = .20$, $p =.43$. There was also no significant

relationship between anxiety and task performance (time divided by number) found in

the experimental group (high levels of empathy), $r = .10$, $p =.82$. In addition, there

was no significant relationship between anxiety and task performance (time divided

by SD distance), $r = .03$, $p = .90$ for the control group (low levels of empathy), as for

the experimental group (high levels of empathy) $r = -.25$, $p = .24$.

Discussion

The aim of the present study was to investigate whether feelings of empathy

were disadvantageously related to task performance. In addition, anxiety levels were

measured to investigate whether anxiety was related to performance on the stitching

task. The relationship between anxiety and performance was expected to be stronger

in the high empathy group compared to the low empathy group. No effect was found

of empathy on task performance, and no relationship was found between anxiety and

task performance. Therefore, the limitations of this study are thoroughly discussed

and implications for further research provided.

Findings and implications

In the present study, no significant effect was found of empathy on task

performance. An explanation for an absence of the effect of empathy on task

performance may be explained by the methodology used in the present study. To

measure task performance a fake arm was used. However, we did not relate this fake

arm to a specific person. Therefore, it may be that participants did not empathize.

Research has found that building a connection to others, could cause an individual to

realize they are 'one of us' and share intentions, desires, and emotions with other

humans (Meltzoff, 2002). Other research have defined empathy as a person's

vicarious matching of the affective state of another (Fesbach & Roe, 1968). For future

research it may be relevant to tell participants the fake arm belongs to the person in

the pictures that they had seen before. In this situation individuals may identify

themselves with that person and this might evoke feelings of empathy.

Another explanation for the absence effect of empathy could be explained by

the measurements used in the present study. The time taken to stitch the wounds and

the efficiency of the task were used to measure task performance. For instance, the

time required to stitch each wound was used as a measure and we predicted that the

higher this number, the worse the performance of the task. Regardless of the

placement of stitches, the stitching procedure is always conducted with

local anesthesia, and this may be an unpleasant experience for the patient

(Westerman, 2004). This implies that the longer the duration of the stitching

procedure, the more unpleasant the experience would be for the patient. Our

predictions were that participants who experienced high levels of empathy would take

longer to stitch the wounds because they may become overly emotionally involved

and therefore, experience overall arousal and personal distress (Eisenberg et al.,

1994). Thus, longer duration is equivalent to reduced performance on the task.

However, it is noteworthy that both measurements were based on assumptions and not

actual findings. Therefore, further investigation is relevant to investigate methods of

suturing and to define measurements of task performance.

Furthermore, no significant relationship was found between anxiety and task

performance. Because the absence of this relationship, no difference was found

between the high empathy group compared to the low empathy group. This finding

contradicts the theory proposed by Marcus (1999) which explored that students who

feel the emotions of a patient as if the emotions were their own, experience increased

self-imposed workload and work anxiety. In addition Davis (1980) found a positive

association between high empathic concern (EC) scores and anxiety. The potential

relationship between anxiety and empathy is important, in that respect, that feelings of

empathy could causes feelings of anxiety, and therefore influence task completion in a

disadvantageous manner. Related to surgeries, this negative influence may have

adversely effects. Earlier research provided training programs in order to help medical

students develop empathic responding towards patients (Fine & Therrien, 1977). In

addition, Barbosa, Raymond, Zlotnick, Wilk, Toomey & Mitchell (2013) examined

the impact of Mindfulness-Based Stress Reduction (MBSR) on students from

healthcare graduate programs. The Mindfulness-Based Stress Reduction (MBSR)

consisted of a program that offered first-hand experience of meditation techniques,

including mindful awareness of daily activities and communication. Barbosa et al.

(2013) has found that this training could reduce anxiety and increase empathy in

healthcare students. These training programs provided support for physicians in order

to develop, regulate and understand feelings of empathy, which may have positively

effects related to task performance. Further research is needed to analyze the

relationship between anxiety and empathy, and to investigate the potential positively

effect of training programs in order to help individuals regulate feelings of empathy.

Limitations

There are several limitations in the present study that must be taken into

consideration.It was not possible to compute a manipulation check, and it is possible

that as empathy was not manipulated, and therefore no significant effect was found.

However, this is unlikely, as earlier research has successfully applied the same

methodology to manipulate empathy (Batson, Early & Salvarani, 1997). In addition,

due to the data recording error, only data of 48 participants were useful in order to

correlate anxiety with empathy.

Participants of the current study were recruited via the University of Leiden,

and had different educational backgrounds. The majority of these students did not

have medical backgrounds, and therefore, the sample may not have been

representative of the population of interest in the present study. Marcus (1999)

described the professional development of medical students in relation to the mechanisms of empathy, and this four-stage theory is relevant to the present study because it explored the underlying mechanisms of empathy, which can explain why empathy is not always beneficial. Furthermore, differences between the personal characteristics of medical students compared to other students may exist and therefore, Marcus' theory may not apply to the students used in the present study. The hypotheses proposed in the present study were partially based on this theory. Further investigation in which medical students are recruited as participants would be more relevant.

Another limitation might be due to the questionnaire used. The State Trait Anxiety Inventory (STAI; Spielberger et al., 1983) was used to measure levels of anxiety. The STAI measured anxiety levels experienced at that moment (State Anxiety) and anxiety commonly experienced, on a day-by-day basis (Trait Anxiety). The present study used only Trait Anxiety to measure levels of anxiety. However, for further investigation, it may be relevant to measure State Anxiety as well. State Anxiety measured anxiety experienced at that moment, which is relevant for task performance. Barbosa et al. (2013) found that increased levels of anxiety, had negative consequences for working related tasks. This experienced stress might be more relevant to State Anxiety instead of Trait Anxiety, and therefore for further investigation, it is important to measure both levels of anxiety.

Conclusion

Despite no significant effects, the current study does provide important insights regarding the mechanisms of empathy and the relationship between empathy and anxiety. Empathic responding is important in relation to the relationship between physicians and patients (Larson & Yao, 2005; Mercer & Reynolds, 2002). This study

provides new insights into whether the consequences of empathic responding have

benefits in all situations. In addition, the importance of anxiety regarding empathy

was explored by earlier research. For further research, methodologies should be

altered in order to explore the mechanisms of empathy related to task completion.

References

Barbosa, P., Raymond, G., Zlotnick, C., Wilk, J., Toomey, R., & Mitchell, J.
(2013). Mindfulness-based stress reduction training is associated with
greater empathy and reduced anxiety for graduate healthcare students.
Education for Health, 26(1), 9-14.

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The
"Reading the mind in the eyes" test revised version: A study with normal
adults, and adults with Asperger syndrome or high-functioning autism.
Journal of Child Psychology and Psychiatry, 42(2), 241-251.

Barrio, V.D., Aluja, A., & García, L. F. (2004). Relationship between empathy and
the Big Five personality traits in a sample of Spanish adolescents. *Social
Behavior and Personality: an international journal, 32*(7), 677-681.

Batson, D. C., Early, S., & Salvarani, G. (1997). Perspective taking: Imagining
how another feels versus imagining how you would feel. *Personality and
Social Psychology Bulletin, 23*(7), 751-758.

Davis, M. H. (1980). A multidimensional approach to individual differences in
empathy. *Catalog of Selected Documents in Psychology, 18*(10), 85.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a
multidimensional approach. *Journal of Personality and Social Psychology,
44*(1), 113-126.

Eisenberg, N., Fabes, R.A., Murphy, B., Karbon, M., Maszk, P., Smith, M., … & Suh,
K. (1994). The relations of emotionality and regulation to dispositional and
situational empathy-related responding. *Journal of personality and social
psychology, 66*(4), 776-797.

Eisenberg, N., & Miller, P. A. (1987). The relation of empathy to prosocial and

related behaviors. *Psychological Bulletin, 101*(1), 91-119.

Eysenck, H. J., & Eysenck, M. W. (1985). Personality and individual differences: A

natural science approach. Plenum Press. *New York*

Feshmach, N. D., & Roe, K. (1968). Empathy in six and seven-years-olds. *Child

Development, 39*(1), 133-145

Fine, V. K., & Therrien, M. E. (1977). Empathy in the doctor-patient relationship:

Skill training for medical students. *Academic Medicine, 52*(9), 752-757.

Larson, E. B., Yao, X. (2005) Clinical empathy as emotional labor in the patient

physician relationship. *Jama, 293*(9), 1100-1106.

Levinson, W., & Chaumeton, N. (1999). Communication between surgeons and

patients in routine office visits. *Surgery, 125*(2), 127-134.

Loewenstein, G. (2005). Hot-cold empathy gaps and medical decision making.

Health Psychology, 24(4), 49-56.

Loudin, J. L., Loukas, A., & Robinson, S. (2003). Relational aggression in college

students: Examining the roles of social anxiety and empathy. *Aggressive

behavior, 29*(5), 430-439

Marcus, E. R. (1999). Empathy, humanism, and the professionalization process of

medical education. *Academic Medicine, 74*(11), 1211-1215.

Mercer, S. W., & Reynolds W. J. (2002). Empathy and quality of care. *British

Journal of General Practice, 52,* 9-13.

Meltzoff, A. N. (2002). Imitation as a mechanism of social cognition: Origins of

empathy, theory of mind, and the representation of action. *Blackwell

handbook of childhood cognitive development,* 6-25.

Motowidlo, S. J., & Scotter, J. R. (1994). Evidence that task performance should   be

distinguished from contextual performance. *Journal of Applied Psychology,*

79(4), 475-480.

Quek, K. F., Low, W. Y., Razack, A. H., Loh, C. S., & Chua, C. B. (2004).

Reliability and validity of the Spielberger State-Trait Anxiety Inventory

(STAI) among urological patients: a Malaysian study. *The Medical Journal*

of Malaysia, 59, 258-267.

Rudebeck, C. E. (2000). The doctor, the patient and the body. *Scandinavian*

Journal of Primary Heath Care, 18(1), 4-8.

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A.

(1983). Manual for the State-Trait Anxiety Scale. *Consulting*

Psychologists.

Tait, R. C., Chibnall, J. T., Luebbert, A., & Sutter, C. (2005). Effect of treatment

success and empathy on surgeon attributions for back surgery outcomes.

Journal of Behavioral Medicine, 28(4), 301-321

Westerman, N. (2004). Integrale Geneeskunde. *Tijdschrift voor Integrale*

Geneeskunde, 20(2), 107-125.

Wood, R. E., (1986). Task complexity: Definition of the construct. *Organizational*

Behavior and Human Decision Processes, 37(1), 60-82.

Appendix A

The STAI Questionnaire, Trait anxiety, used in the present study Spielberger et al.,

1983)

Hieronder vindt u een aantal uitspraken, die door mensen zijn gebruikt om zichzelf te

beschrijven. Lees iedere uitspraak door en geef aan hoe u zich in het algemeen voelt.

Er zijn geen goede of slechte antwoorden. Denk niet te lang na en geef uw eerste

indruk. Het gaat er dus om dat u bij deze vragenlijst weergeeft hoe u zich in het

algemeen voelt.

	Geheel niet	Een beetje	Tamelijk veel	Zeer veel
Ik voel me prettig	○	○	○	○
Ik voel me nerveus en onrustig	○	○	○	○
Ik voel me tevreden	○	○	○	○
Ik kan een tegenslag maar heel moeilijk verwerken	○	○	○	○
Ik voel me in vrijwel alles tekortschieten	○	○	○	○
Ik voel me uitgerust	○	○	○	○
Ik voel me rustig en beheerst	○	○	○	○
Ik voel dat de moeilijkheden zich opstapelen zodat ik er niet meer tegenop kan	○	○	○	○
Ik pieker teveel over dingen die niet zo belangrijk zijn	○	○	○	○
Ik ben gelukkig	○	○	○	○

	Geheel niet	Een beetje	Tamelijk veel	Zeer veel
Ik word geplaagd door storende gedachten	○	○	○	○
Ik heb gebrek aan zelfvertrouwen	○	○	○	○
Ik voel me veilig	○	○	○	○
Ik voel me op mijn gemak	○	○	○	○
Ik ben gelijkmatig van stemming	○	○	○	○
Ik ben tevreden	○	○	○	○
Er zijn gedachten die ik heel moeilijk los kan laten	○	○	○	○
Ik neem teleurstellingen zo zwaar op dat ik ze niet van me af kan zetten	○	○	○	○
Ik ben een rustig iemand	○	○	○	○
Ik raak helemaal gespannen en in beroering als ik denk aan mijn zorgen van de laatste tijd	○	○	○	○

Appendix B

Examples of the disturbing pictures, used in the present study in order to manipulate

empathy (Batson, Early and, Salvarani, 1997)