



## Assessing the Implicit Achievement Motive: Effects of Input-Condition, Administration And Picture-Position

Nicole Gruber<sup>1</sup>, Ludwig Kreuzpointner<sup>2</sup>

<sup>1,2</sup>Universität Regensburg, Germany

### ARTICLE INFO

#### Article History:

Received 14.07.2015

Received in revised form

21.08.2015

Accepted 01.09.2015

Available online

23.09.2015

### ABSTRACT

Implicit measurements are sensitive for influences of experimenter and situation. An assessment using computers could therefore avert those negative effects, if there is an adequate translation to computer (Blankenship, 2010). We split the implicit achievement motive into the two components hope of success (HS) and fear of failure (FF) and investigated the effects of input condition (handwritten vs. keyboard), administration (online vs. computer vs. human experimenter) and picture-position for each of these two components. Therefore 140 undergraduates were randomly assigned to 18 experimental groups of a counterbalance within-between-design and assessed with the Thematic-Apperception-Test (TAT; Heckhausen, 1963). The outcome is that handwriting increases the HS-score, whereby FF-score did not differ in typed and handwritten answers. People instructed by human experimenter show higher FF and lower HS compared to computer based tested people in the labor and online. There is no statistical significant interaction effect of administration and input condition. There is either no position effect for any of these motive-components. The TAT seems to be more robust than commonly thought.

© 2015 IJPES All rights reserved

#### Keywords:

implicit motive, achievement, input, administration, position

### 1. Introduction

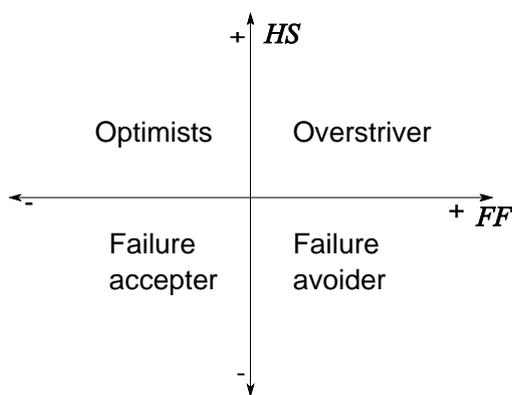
The research of implicit motives is getting more and more important again: In the last ten years 902 studies were conducted using the Thematic Apperception Test (TAT), even more than the number of studies in the 80's and 90's together, which is 759 (Source: Psycinfo, May 2015). The TAT, developed by Morgan and Murray (1935), has been shown to assess implicit motives. Therefore people get presented different pictures with the instruction of writing stories, which leads them to identify with the protagonist of the picture and project their own implicit motives into the story. With this technique of projection, the problem of social desirability can be prevented, because even negative thoughts and needs can be ascribed to the protagonist, not threatening the self. The story depends on the inner world of the subject as well as the prompt-character of the picture and influences of the circumstancing situation. Instead of using this test as a clinical instrument, the research groups of McClelland and of Heckhausen applied this instrument for assessing implicit motives, especially achievement motive (nAch). Heckhausen (1963; English language translation by Schultheiss, 2001) assumed that a motive consists of a need, an instrumental activity, an anticipatory goal, the mention of praise resp. blame, an affective state for achievement as well as an achievement theme and an extra category failure for FF. So he developed a scoring system with 13 categories separately rated for each picture: Six of them define the scale "hope of success" (HS) and seven the scale "fear of failure" (FF).

Heckhausen (1963) used six pictures describing a smiling man at the desk (picture A), a man in front of the directors room (B), two men on the workbench (C), a pupil on the blackboard (D), a man working at the desk

<sup>1</sup> Corresponding author's address: Universität Regensburg, Universitätsstraße 35, D-93053 Regensburg, Germany  
e-mails: [Nicole.Gruber@ur.de](mailto:Nicole.Gruber@ur.de), [Ludwig.Kreuzpointner@ur.de](mailto:Ludwig.Kreuzpointner@ur.de)  
<http://dx.doi.org/10.17220/ijpes.2015.03.002>

(E), two men on a machine (F), whereby three of them mainly activate HS (A, C, E) and three activate FF (B, D, F). People are instructed to write answers to the following four questions: Who are the persons? What do they want and feel? What happened before? How does it proceed? For each picture a score for HS and FF can be reported as well as the achievement motive (nAch), which is generated by the sum of HS and FF. But this simple summation of HS and FF was often criticized: nAch seems not as predictive for behaviour as the distinction into HS and FF (e.g. Pang, 2010). An explanation is according to the quadripolar model of Covington and Roberts (1994) that HS and FF are two relative uncorrelated components of nAch, which should not be summed up, but only interpreted with the other one in mind. Covington and Roberts (1994) further stated four different types of personality characteristics: failure-accepters have low FF and low HS overstrivers have high FF and high HS, optimists have high HS and low FF and failure-avoiders have high FF and low HS (see figure 1). Differentiating these four types is important, because failure-avoiders act to avoid failure or alter the meaning of failure, and do not set themselves realistic aims, they can challenge.

**Figure 1:** The four components of quadripolar model (Covington & Roberts, 1994) described by the two components hope of success (HS) and fear of failure (FF)



The aim of this study is to give a detailed insight in some factors, which influence the assessment of achievement motives, especially under the focus of creating a valid computer-based TAT; And also to get information and investigate our hypothesis about differential effects of these factors by differentiating between the two components of nAch, for which less work is done up to now.

A first factor that could influence the score of nAch is the administration-situation. Schultheiss and Pang (2007) as well as Blankenship (2010) discuss the difference of human experimenter versus computer-based test-situation and assume that test-administration by a human experimenter could lead to higher motive-scores than a computer-based test-situation because the human experimenter will have higher status and so cause more social pressure. So if someone has a high status (like the professor of the course) people will show more nAch than if the test is administered by another student (Smith, 1992). Bernecker and Job (2011) differentiated here also between completely online test situation and computer-based situation with human instructor and stated, that in online setting people are more likely to show their real implicit motives. Another reason for differences could be that the instruction given by a computer is always the same, but human instruction could differ. So Lundy (1985) found that different instruction influences retest-reliability of the TAT and therefore the test results too. Also nonverbal signs like looking on the clock or calling the situation a test could evocate nAch (Gross, 2007). Klinger (1967) evaluated whether nonverbal signals influence nAch. There were two actors: the achievement-type wore suit and tie, behaved like a manager and simulated high nAch. The affiliation-type wore casual clothes and was acting in a social way. The first type stimulated achievement-based statements, the second one affiliation-based statements. But also gender and race are important factors: Dee (2005) found that same race leads to higher nAch. So after all there are many factors in the interaction of experimenter and participants, which can confound a test: Some are unchangeable like gender or race; others are unconscious like nonverbal behaviour. The last one is very important: Jensen et al. (2012) found that unconscious facial expressions change even the strength of placebo-effect, given a pain related stimulus. So Hewson, Laurent and Vogel (1996) generally think measuring with the computer is a better way.

A next factor, that influences the motive-score, is word-count; the longer written stories the more chance have participants to write a motive-relevant aspect for the coding-system and so they get a higher motive-score. Pang and Schultheiss (2005) found a significant correlation of  $r = .23$  between word-count and nAch, Hofer et al. (2010) of  $r = .34$  and Ricciutu (1954) even of  $r = .50$ . Winter (1993) even introduced a word-count-correction. But Lesser, Krawitz and Packard (1963) reported word-count having no influence on nAch. In the study of Schultheiss, Liening and Schad (2008) the subjects wrote TAT-stories with 36 % more words using a keyboard than writing by hand, accompanied by the effect that motive-scores were statistically significant higher when a story was typed. Blankenship and Zoota (1998) investigated these effects for power- and affiliation motive and found that typing-condition does not matter, although people wrote more with the keyboard than by hand.

A third factor that could influence motive-score is the order of the pictures, what Smith (1992) claimed a very important aspect for a good TAT. He proposed to set pictures encouraging less nAch on earlier position of the test, because a picture, which encourages high nAch will inhibit the motive-caused content of the later one. A theoretical frame underlying this is the Dynamics of Action theory (DoA; Atkinson & Birch, 1970). According to this theory writing a specific story is determined by an instigating force (F) to do so and a consummatory force (C), which lowers the need to write about this topic when it was actually done. There are several tendencies concurring with each other, one is for example to show achievement related behaviour. As long as F minus C (after writing about the specific topic) is the highest need, the subject will write about topic F. On some point the instigating force to write about another topic (maybe some affiliation stuff) becomes higher, so that the achievement-score of this story will be lower. Depending on the underlying motive the following story could be influenced by the nAch again, because of the consummatory force of affiliation when writing about and the instigating force of achievement when doing not so. In other words, if someone wrote a very achievement related story in response to the first picture the drive to write a similar achievement related story for the following picture is reduced and he or she will write about something else, but not because of a lower implicit motive, just because the drive of writing such a story was already satisfied by the consummatory force in the first picture. After a time the instigating force will be higher and so on, for example in the next picture a hope for success content will appear. For this resulting cyclic descending course over time the effect is also called the "saw tooth effect" (Atkinson, Bongort & Price, 1977).

Reumann (1982) assessed this effect empirically using an 8-picture TAT: Comparing the score of the first and last four pictures he found that stories of later pictures significantly contain less nAch statements than earlier ones. Also Tuerlinckx, deBoeck and Lens (2002) as well as Schultheiss et al. (2008) investigated the assumptions of DoA empirically, but had to contradict it. Pang and Schultheiss (2005) found this theory only fitting to affiliation- and power-motive but not to nAch. A reason for this could be that nAch consists of the two aspects fear of failure and hope of success. So Blankenship (1987; 2010) differentiated these components and calculated a computer simulation for four hypothetical subjects, finding that only people with high instigating force F to achieve success show typically high motive cycles as expected in the DoA. She also proved the results of this simulation in three experimental designs; but it has not been empirically investigated with the TAT so far.

To put all in a nutshell, there is still little research, which has a differentiated view on the difference of computer- versus human-based test situation and the role of handwritten and typed answers regarding HS and FF. And also the position-effects of the DoA using these two components has been less researched. So the aim of the conducted study is to investigate in an experimental design whether the current results regarding input-condition, administration and picture-position can be replicated, having a view on the two components of achievement motives.

## **2. Expectations**

There are some expectations we conduct to the following study according to the underlying research: With Schultheiss and Pang (2007) in the comparisons of computer vs. human-administrated test higher motive-scores in the human-administrated test-session are expected, because the human-administrator will be seen as an authority and evocate social pressure. This aspect will mostly lead to a higher fear of failure-score

instead of hope of success, because as Heckhausen (1963) claimed, being under the eye of an authority-person will force FF. So a human-administrated situation will force the score of HS and especially fear-related components in comparison with the computer administrated condition. The online computer-test without human instructor will force the lowest motive-scores.

We further expect that word-count has a statistical significant influence on the scores of HS and FF, and because people can write more with the keyboard - and so have more change to give a motive related answer -, they will show higher motive-scores in the typed condition than in the handwritten condition (Schultheiss et al., 2008). Besides we assume that typing-experience will influence the difference between typed and handwritten motive-score (because it determinates word-count) in that way that the higher the typing-experience the more difference will be between word-count (and so motive-scores) on typed vs. handwritten answers.

We further investigate whether there is an interaction-effect of input-condition and administration, which is very relevant when looking forward to a computer-based TAT. So if a human-administrated test will increase FF and HS and typing will do the same, an interaction might occur in that way that the highest scores for FF and HS will be expected when the administration is done by human instructor and the answers are given typed. A reason for this could be that commonly people answer questionnaires given by a human with hand and those given by PC with keyboard: The new situation of writing with keyboard and being under the eye of a human instructor appears as a special task, which forces HS and FF, so people will write more with the keyboard in this situation than when instructed by the computer. Also handwriting and being instructed by a human is naturally and so will not force that much HS and FF than typing. Writing by hand but being instructed by computer will lead to lower HS and FF scores especially in the online setting, because the computer forces less motivation. So the main effect of input condition depends on whether the instruction is given by a human or a computer: The difference of keyboard and handwritten answers will be higher if the instruction is done by human than if it was done by computer.

Finally we think, in addition to Atkinson and Birch's (1970) DoA, picture-position will have an influence on the yielded motive-score of each picture: Earlier pictures will evocate more HS or FF than later. As this effect also depends on the strength of motive, we think this effect is influenced by both input-condition and administration. So typing will cause more motive-related answers and lead to an increase of motive-scores, those pictures with typed answers will show a higher position-effect in that way that when answers are typed, the pictures on the first and last position will force more motive-related answers than when it is handwritten. But the stories wrote for pictures in the second position will have lower motive content when typed than when handwritten, because as assumed in the DoA there will be higher cycles in response to the high enforcement. For administration the same is expected. Administration by human experimenter will force more motives on the first and third picture, but less on the second comparing with those done by computer (Gruber, 2014).

### 3. Method

#### 3.1. Design and Participants

For testing our hypothesis a  $3 \times 2 \times 3$  (picture-position [1, 2, 3] x input condition [hand, keyboard] x administration [human, computer, online]) mixed within/between subject design was used. So the three factors, which influence motive strengths and its components, can be separately manipulated. To assess the position-effect, the picture pairs consisting of a HS and a FF-picture, were not changed, which is most comparable to the origin TAT (Heckhausen, 1963). So each HS-picture was followed by an FF-picture, whereby the session started with a HS-picture (see table 1). For testing the difference of typed and handwritten answers a within-design was used, because taking the test again is a problem for projective tests like the TAT. People would try to write different stories comparing to the first session – not because they now write by hand or type, just because they have already seen the pictures before and projected their motives on it, preconditioned they did not change in the meantime (Lundy, 1985). As a position-effect is expected in DoA, there has to be a variation whether people type first or start writing with hand. So the first two pictures (one couple) have to be handwritten or typed and then the following four pictures have to be typed or handwritten (Gruber, 2014).

**Table 1:** Design of the study

Picture-Position	Administration		
	Experimenter	Computer	Online
A* - B* - C - D - E - F			
C* - D* - E - F - A - B			
E* - F* - A - B - C - D			
A - B - C* - D* - E* - F*			
C - D - E* - F* - A* - B*			
E - F - A* - B* - C* - D*			

Note: \* pictures were typed, nonmarked pictures were written by hand.

Originally 140 people (101 female and 39 male) took part at several sessions. After the elimination of seven uncompleted and / or unserious-taken test-responses the data of 96 female and 37 male undergraduate students, age between 19 and 46 years ( $M = 22.76$ ;  $SD = 3.90$ ), remained. They were enrolled in different subjects at the Universität Regensburg in different semesters ( $M = 4.82$ ;  $SD = 2.43$ ) and had different experience in typing on the computer from none to high (0-4;  $M = 1.98$ ;  $SD = 1.30$ ). All of the participants were randomly assigned to one of the 18 conditions.

### 3.2. Materials

Materials were a questionnaire of demographic data (code, age, sex, semester, subject, graduation, and experience in typing), the six pictures of Heckhausen’s TAT (1963), headphones, PC (Dell Optiplex 755) with keyboard, a writing sheet with pencil, a beamer and a clock.

### 3.3. Procedure

The people were recruited with fliers, posters, emails and within course lessons. Each session was held in a university computer room, lasted about 35 minutes and administered in small groups. Each room consisted of 16 to 26 PCs with a distance between the PCs about 0.70 meters.

#### 3.3.1. Instruction via Computer

The experimenter shortly introduced the participants and distributed headphones. Then the subjects randomly got papers with a written instruction and the URL for the test. There was no further instruction by the experimenter; but she stayed in the room for answering questions and for having an eye on the participants. After completing biographical questions on the PC, the participants read the standardized instruction of Heckhausen (1963) on the computer and started the test. Each picture was displayed on the computer screen for 20 seconds. After this the participants had five minutes to answer four questions in response to the picture (one minute for each question and one minute for correction). These responses were made on writing sheets (handwrite-condition) or on the PC using the keyboard (typing-condition). After one minute an acoustical signal was given for each question and after five minutes the next picture automatically appeared. At the end of the experiment participants were given candies as a thank-you-gift.

#### 3.3.2. Instruction via Experimenter

The procedure was similar to that in the instruction via computer-condition: the participants were also given a URL for the online test and writing sheets; but in this condition they got no headphones; the experimenter explained the test instruction orally, presented each picture via projector and measured the time-limit by a clock in a casual way, strictly following the instructions of Heckhausen (1963).

#### 3.3.3. Complete online test

In the complete online test, the participants got sheets of papers and the link for the TAT as in 3.3.1. They were free to do the test wherever and whenever they want within a limit of two weeks. After they took the test, they throw their sheet of paper in a box before the instructor’s room.

### 3.4. Analysis

Before analysing the stories were scored for the implicit achievement motive by two trained coders using the Heckhausen scoring-system (1963 with an additional category proposed by Breidebach, 2012), which allows separated coding of hope of success and fear of failure. Breidebach suggests a new category he called “sureness of success” ( $E_{SC}$ ), which should be the pedant of failure in the FF category, so this aspect was also coded in this study. The inter-rater-agreement assessed with the  $a_d$ -coefficient by Kreuzpointner, Simon and Theis (2010) and Pearson correlations (given in brackets) was  $a_d = .998$  for HS ( $r = .90$ ) and  $a_d = .998$  for FF ( $r = .87$ ), which is in both cases above the 95% level. Also the intra-rater-agreement in a delay of four weeks was measured: for HS between  $a_d = .998$  ( $r = .82$ ) and  $a_d = .999$  ( $r = .95$ ) and for FF between  $a_d = .998$  ( $r = .82$ ) and  $a_d = .999$  ( $r = .91$ ). Being a very strict measure, the high  $a_d$ -coefficients indicate high objectivity.

The influence of administration condition on HS and FF was tested by three-way ANOVAs. The dependent variable therefore was the summed score of the three picture pairs, separated for HS and FF. So pair one (P1) includes the score from A and B, pair two (P2) consists of C and D, pair three (P3) contains E and F. If the administration condition would have an influence, a main effect should occur. The general influence for input-condition should get obvious in an interaction effect of input-type (typed first vs. handwritten first) with position-effect. If this effect is determined by type-experience this should be a statistical significant factor. The same analysis was done to find whether word-count differs in typed and handwritten answers. To check if HS and FF depend on word-count, a Pearson correlation was calculated.

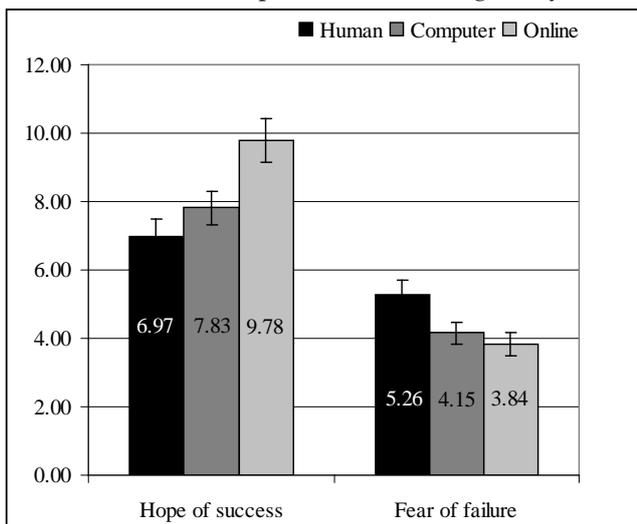
To test the interaction of administration and input condition, three-way ANOVAs were calculated. The position-effect was assessed by several ANOVAs, whereby a simple position-effect is obvious in an interaction of the repeated factor “picture pair” and its position (two-way ANOVAs). A possible influence of administration or input-condition should get obvious in a further interaction (three-way ANOVAs) and post-hoc-tests.

## 4. Results

### 4.1. Administration and input

First the influence of the administration done by a human experimenter, computer or online on the score of hope of success and fear of failure was investigated (see figure 2).

**Figure 2:** Overall-score of hope of success (HS) and fear of failure (FF) depending on administration. Standard errors are represented in the figure by the error bars attached to each column.



The overall mean-score of HS of each picture-pair is with 3.26 ( $SD = 1.59$ ) in the online test session a bit higher than for the computer administrated test (2.59;  $SD = 1.92$ ) and even for that with human experimenter ( $M = 2.32$ ;  $SD = 1.87$ ;  $F(2, 130) = 6.32$ ,  $p < .01$ ,  $\eta_p = .09$ ). There was also a difference for FF: People administrated by human experimenter show significantly higher FF ( $M = 1.78$ ;  $SD = 1.33$ ) than people instructed by computer ( $M = 1.38$ ,  $SD = 1.10$ ) or in the onlinetest session ( $M = 1.28$ ,  $SD = 0.88$ ,  $F(2, 130) = 4.20$ ,  $p < .05$ ,  $\eta_p = .06$ ).

Regarding input-condition it could be assessed that people generally wrote more words with keyboard ( $M = 183.26, SD = 32.28$ ) than with hand ( $M = 148.02, SD = 51.61, F(2, 130) = 15.69, p = .00, \eta_p = .30$ ) and that there is no statistical significant correlation between typed word-count with HS ( $r = .18, n.s.$ ) and with FF ( $r = .15, n.s.$ ). But there is a statistical significant difference of HS ( $F(2, 133) = 4.60, p < .05, \eta_p = .08$ ) in that way, that people have higher HS scores for the first worked picture pair, when they wrote with hand ( $M = 2.88, SD = 1.54$ ) than when they wrote with keyboard ( $M = 2.52, SD = 1.40$ ). The score for FF ( $F(2, 133) = .82, n.s., \eta_p = .01$ ) did not differ in this condition. Typing-experience showed no influence on this effect for hope for success ( $F(2, 133) = 2.71, n.s., \eta_p = .08$ ) as well as for FF ( $F(2, 133) = .82, n.s., \eta_p = .01$ ). When having a look at the interaction with administration it gets obvious that whether the test is instructed by computer or human instructor or online has no influence on HS ( $F(2, 132) = 0.30, n.s., \eta_p = .01$ ) or FF ( $F(2, 132) = 2.38, n.s., \eta_p = .07$ ), although the last one is a little effect with  $p = .06$ . In table 2 a short overview of these results will be given.

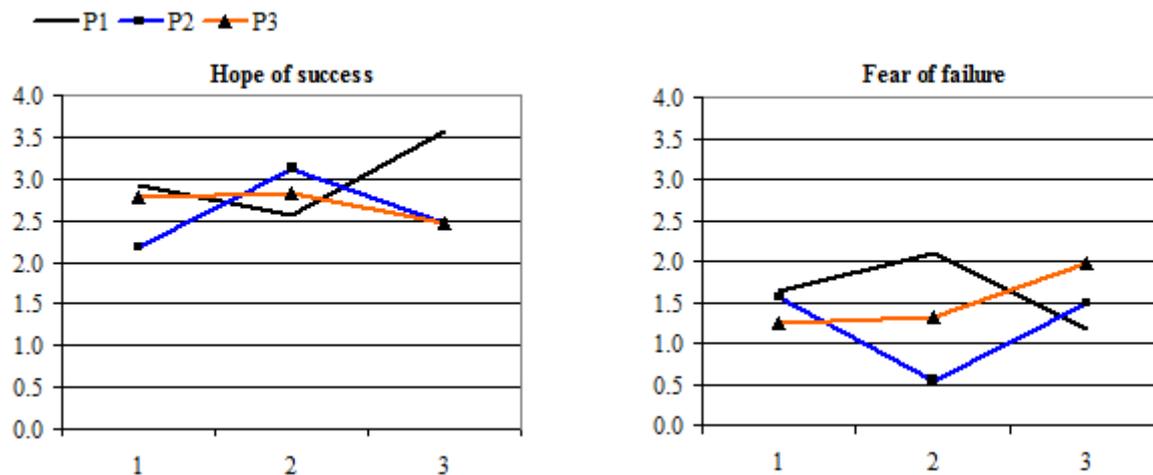
**Table 2:** Influence of input-condition and administration on hope of success (HS) and fear of failure (FF).

	Input						Administration						Input x Administration						
	Hand		Keyboard		F	p	$\eta_p$	Online		Computer		Human		F	p	$\eta_p$			
	M	SD	M	SD				M	SD	M	SD	M	SD						
HS	2.88	1.54	2.52	1.40	4.60	.03	.08	3.26	1.59	2.59	1.92	2.32	1.87	6.32	.01	.09	0.30	.75	.01
FF	1.32	1.06	1.48	1.14	.82	.37	.01	1.28	0.88	1.38	1.10	1.78	1.33	4.20	.02	.06	2.38	.06	.07

**4.2. Position**

To evaluate the position-effect we tested first, whether the scores of FF and HS for each picture pair (consisting of one HS picture and one FF picture) change, when the picture are in different sort-order. Therefore ANOVAs with position as between-factor, the three scores of each motive as within-factor and the dependent variables HS and FF are calculated. So when position and picture change in the same way there must be a statistical significant interaction if there is a position effect. But there was no statistical significant interaction for HS ( $F(4, 133) = 1.24, n.s., \eta_p = .03$ ) or FF ( $F(4, 133) = 1.42, n.s., \eta_p = .02$ ), although they differently change over position (as obvious in figure 3). Not even a post-hoc analysis with the very liberal LSD-Test found any statistical significant changes between the picture pairs for HS or FF.

**Figure 3:** Scores of all three pairs depending on position for hope of success and fear of failure



Note: P1 = pair one (picture A+B), P2 = pair two (picture C+D), P3 = pair three (picture E+F)

Next it was questioned whether a specific instruction or the input-condition could evocate a position effect (see table 3). But there was no statistical significant result neither for HS ( $F(4, 133) = .87, n.s., \eta_p = .01$ ) nor for FF ( $F(4, 133) = 1.09, n.s., \eta_p = .05$ ) when the instruction was given by human or computer. And there was also no statistical significant result for HS ( $F(4, 133) = 2.52, n.s., \eta_p = .08$ ) or FF ( $F(4, 133) = .08, n.s., \eta_p = .01$ ) when the answers were typed or handwritten.

**Table 3:** Influence of input-condition and administration on the position effect of hope of success (HS) and fear of failure (FF).

	pic x pos			pic x pos x adm			pic x pos x input		
	F	p	$\eta_p$	F	p	$\eta_p$	F	p	$\eta_p$
HS	1.24	.30	.02	.87	.48	.01	2.52	.08	.05
FF	1.42	.22	.02	1.09	.37	.04	.08	.76	.01

Note: pic = picture, pos = position, adm = administration.

## 5. Discussion

First we expected similar to Blankenship (2010) and Schultheiss and Pang (2007) a human instructor to evocate more social press and therefore the human-administrated test to generally force higher motive-score than the computer-based test and especially an online test without human instructor. But having a differentiated view on hope of success and fear of failure, HS was highest in the online test, without an influence of human instructor. Regarding FF the human-administrated test was found to evocate a higher score than the computer-based test in front of the instructor and in the online setting. An explanation of this result advanced Heckhausen (1963), who suggested FF being forced by an authority or at least a person who can give a negative evaluation of ones' achievement. So the kind of expected social press, which was expected by Schultheiss and Pang (2007), can be assumed as a component of FF and also changes the HS score.

Second it was assumed that, because nowadays people write more with keyboard and word-count generally influences nAch (e.g. Schultheiss et al., 2008; Hofer et al., 2010; Ricciutu, 1954), both motive-scores of HS and FF to be higher in the typed than in the handwritten condition. But only the fact, that people generally wrote more in the typed than in the handwritten condition, could be verified (see Blankenship & Zoota, 1998). Against our expectations the numbers of words had no influence on the scores of HS and FF. This could also depend on Heckhausens scoring-system, because compared to Winter (1993) not every sentence is scored only every paragraph. So the practical implication is, that the motive-scores of this measurement are not influenced by word-count and calculating a word-count-correction as given by Winter (1993) is not required. As a conclusion the expectation that people writing more and so having more chance to give a motive-relevant answer and to reach a higher motive-score had to be dropped. We did not even find HS and FF to be higher in the typed condition: Surprising and against our expectations people wrote more HS related answers with hand than with keyboard. The hypothesis experience in typing would explain differences in motive-scores of typed answers, could not be verified as well, mainly for the low correlations of word-count and the motive-scores of HS and FF.

Next we assumed an interaction effect of administration and input-condition in that way, that especially in the typed and human-administrated test situation the motive-scores of HS and FF will be high. This could not be verified either; there was only a small effect for FF. An explanation of this could be that the human-administration influences how handwritten and typed answers differ in motive-score and the human-administration mostly causes FF and a little HS. This also predicates for the quadripolar model of Covington and Roberts (1994) to see HS and FF as independent factors, which only work in combination to each other.

The hypothesis regarding the DoA has to be rejected as well. But we find some indices for the assumption of Blankenship (1987) that HS will show a typically cyclic course, when having a look at the interaction with input condition and position-effect: Handwritten answers showed more HS and so are a little more fitting to the DoA. Although the score of FF also depends on the levels of administration no administration x position-effect interaction could be attested, which is a little hint, that as Blankenship (1987) assumed DoA would fit only on HS, but this has to be evaluated with other groups like optimists and failure avoiders. Another limitation is that the pictures themselves differently force HS and FF so for example the third picture pair evocated mostly HS and less FF, while the second picture pair evocate more FF than HS. This different progress of the motivational components could also cause from the fact, that HS and FF are two different factors in that way that consummatory force decreases HS so that the instigating force of FF sets in and FF is activated. So this also influences the regarding to DoA expected cyclic course and as Smith (1992) wrote, the rank order of pictures is a very important aspect, which also and especially influences the total motive score.

## 6. Acknowledges

We specially want to thank Christina Hanauer for recoding the TAT-scores. We are also grateful to the reviewers of previous versions of this manuscript for their constructive and helpful critics. This work was supported by the German Research Foundation (DFG) within the funding program Open Access Publishing.

## 7. References

- Atkinson, J. W. & Birch, D. (1970). *The dynamics of action*. New York: Wiley.
- Atkinson, J. W., Bongort, K. & Price, L. H. (1977). Explorations using computer simulation to comprehend thematic apperceptive measurement of motivation. *Motivation and Emotion, 1*, 1-27. doi: 10.1007/BF00997578
- Bernecker, K., & Job, V. (2011). Assessing implicit motives with an online version of the picture story exercise. *Motivation and Emotion, 35*(3), 251-266. doi: 10.1007/s11031-010-9175-8
- Blankenship, V. (1987). A computer-based measure of resultant achievement motivation. *Journal of Personality and Social Psychology, 53*, 361–372. doi: 10.1037/0022-3514.53.2.361
- Blankenship, V. (2010). Computer-based modelling, assessment, and coding of implicit motives. In O.C. Schultheiss & J.C. Brunstein (Eds.), *Implicit motives* (pp. 186-209). New York: Oxford University Press.
- Blankenship, V. & Zoota, A. (1998). Comparing power imagery in TATs written by hand or on the computer. *Behavior Research Methods, Instruments & Computers, 30* (3), 441-448. doi:10.3758/BF03200677
- Breidebach, G. (2012). *Bildungsbenachteiligung – warum die einen nicht können und die anderen nicht wollen [Educational disadvantage – why some can't and others don't want]*. Hamburg: Kovacs.
- Covington, M. V. & Roberts, B. W. (1994). Self-worth and college achievement: Motivational and personality correlates. In P. R. Pintrich, D. R. Brown & C. E. Weinstein (Eds.), *Student motivation, cognition and learning* (pp. 157-188). Hillsdale, NJ: Erlbaum.
- Dee, T. S. (2005). A teacher like me: does race, ethnicity, or gender matter? *The American Economic Review, 95* (2), 158-165. doi: 10.1257/000282805774670446
- Gross, T. (2007). *Mensch und Computer [Human and Computer]*. München: Oldenbourg.
- Gruber, N. (2014). *Ist eine Computerversion bei der Messung impliziter Motive der Papier-Bleistift-Version überlegen? Eine Untersuchung am Beispiel des TAT nach Heckhausen [Is a computer-version superior to the paper-pencil-version in measuring implicit motives? An investigation using the TAT/PSE of Heckhausen]*. Regensburg: Roderer.
- Heckhausen, H. (1963). *Hoffnung und Furcht in der Leistungsmotivation. [Hope and fear components of achievement motivation]*. Meisenheim am Glan: Anton Hain.
- Hewson, C. M., Laurent, D. & Vogel, D. M. (1996). Proper methodologies for psychological and sociological studies conducted via the Internet. *Behaviour Research Methods, Instruments & Computers, 28* (2), 186-191. doi: 10.3758/BF03204763
- Hofer, J., Busch, H., Bond, M. H., Kärtner, K., Kiessling, F., & Law, R. (2010). Is self-determined functioning a universal prerequisite for motive–goal congruence? Examining the domain of achievement in three cultures. *Journal of Personality, 78* (2), 747-779. doi: 10.1111/j.1467-6494.2010.00632.x
- Jensen, K., Kaptchuk, T. J., Kirsch, I., Raicek, J., Lindstrom, K. M., ... Kong, J. (2012). Non-conscious activation of placebo and nocebo pain responses. *Proceedings of the National Academy of Science of the United States of America, 109* (39), 15959-15964. doi: 10.1073/pnas.1202056109
- Klinger, E. (1967). Modeling effects on achievement imagery. *Journal of Personality and Social Psychology, 7*, 49-62. doi: 10.1037/h0024936
- Kreuzpointner, L., Simon, P. & Theis, F. J. (2010). The  $\alpha$ -coefficient as a descriptive measure of the within-group agreement of ratings. *British Journal of Mathematical and Statistical Psychology, 63* (2), 341-360. doi: 10.1348/000711009X465647
- Lesser, G. L., Krawitz, R. N. & Packard, R. (1963). Experimental arousal on achievement motive in adolescent girls. *Journal of Abnormal and Social Psychology, 66* (19), 59-66. doi: 10.1037/h0042942
- Lundy, A. C. (1985). The reliability of the thematic apperception test. *Journal of personality assessment, 49*, 141-145. doi: 10.1207/s15327752jpa4902\_6
- Morgan, C. D. & Murray, H. A. (1935). A method for investigating fantasies: The thematic apperception test. *Archives of Neurological Psychiatry, 34*, 289-306. doi: 10.1001/archneuropsych.1935.02250200049005

- Pang, J. S. (2010). The achievement motive: A review of theory and assessment of N Achievement, hope of success and fear of failure. In O. C. Schultheiss & J. C. Brunstein (Eds.), *Implicit motives* (pp. 30-70). New York: Oxford University Press.
- Pang, J. S. & Schultheiss, O. C. (2005). Assessing implicit motives in U.S. college students: Effects of picture type and position, gender and ethnicity, and cross-cultural comparisons. *Journal of Personality Assessment*, 85 (3), 280-294. doi: 10.1207/s15327752jpa8503\_04
- Reumann, D. (1982). Ipsative behavioural variability and the quality of thematic apperceptive measurement of the need for achievement. *Journal of Personality and Social Psychology*, 43 (5), 1098-1110. doi: 10.1037/0022-3514.43.5.1098
- Ricciutu, H. N. (1954). *The prediction of academic grades with a projective test of achievement motivation*. Princeton: Educational Testing Service.
- Schultheiss, O. C. (2001). *Manual for the assessment of hope of success and fear of failure. English translation of Heckhausen's need achievement measures*. Unpublished scoring manual. University of Michigan, Ann Arbor.
- Schultheiss, O.C., Liening, S. & Schad, D. (2008). The reliability of a picture story exercise measure of implicit motives: Estimates of internal consistency, retest reliability, and ipsative stability. *Journal of Research in Personality*, 42, 1560-1571. doi: 10.1016/j.jrp.2008.07.008
- Schultheiss, O. C. & Pang, J. S. (2007). Measuring implicit motives. In: R.W. Robins, R.C. Fraley & R.F. Krueger. *Handbook of research methods in personality psychology*. (pp. 322-345). New York: Guilford.
- Schultheiss, O. C., & Schultheiss, M. (2014). Implicit Motive Profile Analysis: An If-Then Contingency Approach to the Picture-Story Exercise. *Social and Personality Psychology Compass*, 8(1), 1-16. doi: 10.1111/spc3.12082
- Smith, C. P. (1992). *Motivation and personality. Handbook of thematic content analysis*. New York: Cambridge University Press.
- Tuerlinckx, F., De Boeck, P. & Lens, W. (2002). Measuring needs with the Thematic Apperception Test: A psychometric study. *Journal of Personality and Social Psychology*, 82, 448-461. doi: 10.1037/0022-3514.82.3.448
- Winter, D. G. (1993). Power, affiliation, and war. *Journal of Personality and Social Psychology*, 65, 532-545. doi: 10.1037/0022-3514.65.3.532