

Abstract

Micro-psychokinesis is a phenomenon that has been researched for decades but still remains a mystery and is based on quantum mechanical processes. In this study, micro-psychokinetic effects were investigated with erotic images. For this purpose, test subjects were presented with images containing erotic and neutral stimuli. These images were projected using a quantum random number generator and a balanced relationship between the erotic and neutral stimuli was to prevail.

Based on the amount of erotic stimuli actually seen at the end, the aim was to determine whether an unconscious, directed influence on the random process - micro-psychokinesis - had taken place. Based on the sample collected in this study, no micro-psychokinetic effects were found for any of the hypotheses tested. However, this could also have been caused by the formulation of the hypotheses and by small sub-samples.

Keywords: micro-psychokinesis, quantum random number generator, erotic stimuli,
quantum mechanics, quantum physics

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Introduction

This Bachelor's thesis for the degree of Bachelor of Science (B. Sc.) in Psychology deals with the empirical investigation of a directed influence of random processes on a minimal scale with the help of the presentation of erotic image material. This phenomenon is also known as micro-psychokinesis. In order to immerse oneself in this complex - and sometimes intuitively incomprehensible - topic and gain an understanding of it, a brief insight into quantum mechanics and related fields and branches of research is necessary.

Theoretical background

Micro-psychokinesis is the directed, minimal, mental influence of people on processes in the environment. The aim of the study described here was to test micro-psychokinetic effects by observing and measuring unconsciously rooted needs of quantum experimental events. Different groups of people were asked to look at pictures selected by a random number generator. Images with either neutral or erotic content each had a 50% chance of being observed. The study focused on the subconscious influence of this process. Before observation by the test subject, both types of images (erotic content vs. non-erotic content) should coexist in the principle of superposition and thus their occurrence should be equally likely. This means that both types of images overlap but do not interfere with or influence each other; only the final result can be altered (Greenberger, Horne, & Zeilinger, 1993). Through the process of measuring, in the context of the study, the subject's mind should unconsciously favor one of the two states - erotic or non-erotic imagery. And thus the subject should choose one of the

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both types of images with a higher probability or frequency, depending on their unconscious needs.

Quantum theory and Quantum mechanics

In order to better understand these complex relationships and uncover the background, it is necessary to deal with quantum theory.

The discovery and research of quantum theory began around 1900 by Max Planck (Baumann, 2013). His findings and research were further developed over the years by renowned physicists such as Max Born (Born, 1926), Werner Heisenberg (Heisenberg, 1985), Albert Einstein (Einstein, Podolsky, & Rosen, 1935), Niels Bohr (Bohr, 1935), Erwin Schrödinger (Schrödinger, 1935) and many others. We can build on the findings of their research today; they provided foundations, perspectives and interpretations of a world that lies beyond our eyes and our intuitive everyday understanding. As far as quantum theory is concerned, there are several interpretations and approaches, and the discussion about these many different interpretations has not subsided for decades (Baumann, 2013). In this short, theoretical introduction, I will give a brief introduction to the Copenhagen interpretation - an interpretation that takes a more physical perspective on the topic. - I will also go into an interpretation based on the authors of Neumann and Wigner, which focuses on the mind-matter interaction. In order to understand these interpretations of the quantum world, one must take a short journey through the history of this branch of research.

The pioneer of all views of quantum mechanics was particle-wave dualism. Coined by Einstein, Heisenberg and Schrödinger, among others, it is assumed that the objects of quantum physics (quantum objects) have the properties of both classical waves and classical particles.

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have to be taken into account. Classical waves can have different effects in different places at the same time due to the fact that they propagate to all sides in space and also overlap each other. In contrast, a particle can only exist at a single, specific location at any given time. At first glance and with common sense, these two states hardly seem compatible. But if you delve deeper into the subject of quantum physics, you will find an experiment that makes this complex idea a little clearer.

The double-slit experiment

The double-slit experiment was conceived in its original form by Thomas Young and carried out with light. The procedure is as follows:

A light source shines the most monochromatic, coherent light possible onto a double slit. The double slit consists of a plate that shields the light and has two narrow slits.

Behind this double slit is a projection screen that collects the part of the light that was able to pass through the double slit for the purpose of analyzing the experiment.

(Camejo, 2006, p.35)

As a layman, one would expect a very simple outcome to this experiment: a strip of light with a classic and expected light intensity distribution should appear behind each of the two slits (P_1 and P_2), the rest of the projection screen should be dark. And in fact this happens even if the light is only sent through one of the two slits. However, if the light can shine through both openings, an unexpected and initially inexplicable pattern appears - a sequence of light and dark stripes. The so-called interference pattern (see Figure 1).

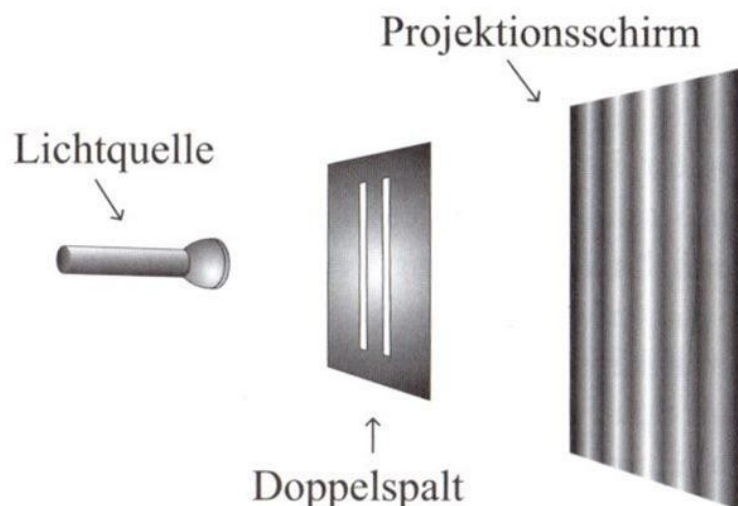


Figure 1: Simplified representation of the experimental setup of the double-slit experiment with light and the resulting interference pattern on the photographic plate (Camejo, 2006, p.38).

Obviously, $P_{1+2} \neq P_1 + P_2$ applies to this experiment, the double-slit experiment with light (Camejo, 2006). How can this be explained? In order to answer this question, it is necessary to describe the process of inference. Waves have the ability to reinforce each other by superimposing wave crests (constructive inference) and to cancel out wave troughs (destructive inference) (see Figure 2).

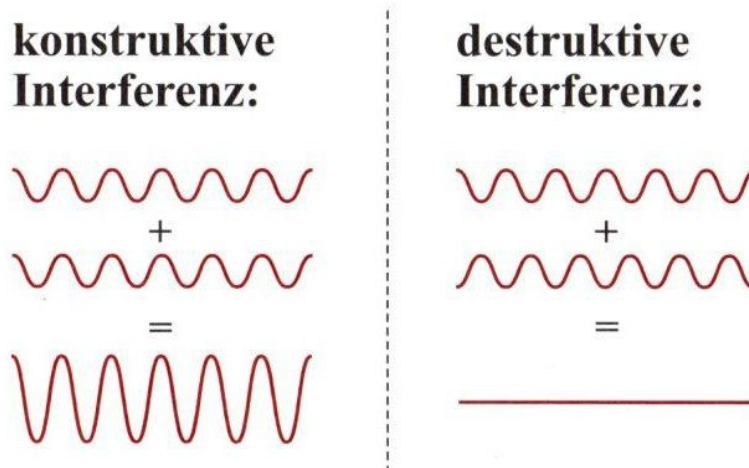


Figure 2: Schematic representation of the principle of inference in waves (Camejo, 2006, p.39).

Particles do not have this ability. If we imagine the light in the double-slit experiment as a wave, we can explain its behavior in this particular situation.

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can be seen. The bright stripes on the projector screen are caused by constructive interference, the dark stripes are caused by destructive interference (Camejo, 2006). This is made possible by the fact that after the plate with the double slit there are two light sources that can potentiate or cancel each other out (see Figure 1). Nevertheless, it cannot be concluded from this alone that light is definitely a wave. This is because in other experiments, such as the photoelectric effect, light behaves characteristically for a particle (Hertz, 1887).

The same phenomenon occurs if the experiment is carried out with electrons instead of electromagnetic radiation (light). This means that here, too, we have to accept that electrons also have the properties of a wave under certain circumstances. An alternative approach to explaining this phenomenon without abandoning the theory of the particle model is to consider that the electrons somehow communicate and collide with each other after they have passed slits 1 and 2, thus creating the stripe pattern on the plate. However, this theory also had to be rejected. Because even if the process is slowed down experimentally and only one electron is sent through one of the two slits at a time, meaning that the electrons cannot "communicate" with each other, the familiar interference pattern is created. If a detector is now attached to the slit, which emits a signal for each passing electron, something unexpected happens again: instead of an interference pattern, two stripes are produced. The electrons behave like particles again when observed at the double slit. This means that electromagnetic radiation is also subject to the influence of wave-particle dualism. But how is it that quantum objects can be both particles and waves? This is where the Copenhagen interpretation comes into play.

Copenhagen Interpretation

The Copenhagen interpretation of quantum mechanics is based on Born's probability interpretation of the wave function (Born, 1926), and was developed jointly by Werner Heisenberg and Niels Bohr. Basically, it states that "every observation of atomic phenomena requires a non-negligible interaction with the means of measurement" (Bohr, 1928). According to this interpretation of quantum theory, this means that every observation and every attempt at a measurement is an uncontrollable factor in the quantum system, whereby the object being measured is outside this system. According to the interpretation, observations thus cause "uncontrollable disturbances of the object under consideration" (Baumann, 2013, p.17), which means that the future behavior of this particular object can no longer be predicted. It is therefore impossible to capture an object spatially and temporally and at the same time establish a causal relationship. According to the Copenhagen view, it is therefore not possible to separate the object from the observer, so according to Bohr, a quantum object is also inseparable from the situation in which it finds itself. Another important point of this interpretation is that it does not see quantum mechanics as probability-free. It states that the probabilities of the system are not caused by ignorance about the state of the system, but are an integral part of the system and thus also of the interpretation of the system. The wave function thus describes a quantum object as precisely as possible and yet only provides probability statements about how the measurement could possibly turn out. The assumption of the Copenhagen interpretation that object and

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measurement or observer could explain the strange results of the double-slit experiment.

Perhaps the electrons realize that they are being observed and therefore no longer exhibit a wave pattern, but behave like particles again. If one now applies the Copenhagen interpretation to the double-slit experiment, only what arrives on the rear plate can be measured. No statement can be made about the origin of these results. According to this interpretation, both the location and the momentum of the particle only exist at the moment the measurement takes place (Heisenberg's uncertainty principle, (Heisenberg, 1985)). Only the measurement process creates the visibility of the particle. We cannot say beforehand exactly where the quantum object is located behind the slit or which path it takes to get there, because it does so in a state of superposition. It is therefore located in all possible places, which is reminiscent of the properties and distributions of a wave, which also propagates in all possible directions. The location of the quantum object is only determined by the measurement and the associated collapse of the wave function. The superposition is destroyed by the intervention of the measurement in the process, so the location of the quantum object is not determined by the measurement, but generated.

As already mentioned, however, the Copenhagen interpretation instinctively assumes that the measured object is outside the system. However, this cannot be supported and assumed. This is where an interpretation of quantum mechanics by Neumann and Wigner comes in, which addresses precisely this weakness of the Copenhagen interpretation.

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and also places a stronger focus on mind-matter interaction - a factor that is of the utmost importance for the phenomenon of micro-psychokinesis investigated here.

Interpretation according to von Neumann and Wigner

The central point of the von Neumann-Wigner interpretation is awareness (Wigner, 1995). This is required in order to be able to complete the process of measurement at all. Conscious observation is a necessary element to achieve the transition from the quantum state to the state during the measurement. Thus, the process of measurement is only completed when the result is consciously perceived and the wave function collapses. The measurement is thus equated with the process of conscious observation (Wigner, 1963 cited in Maier & Dechamps, in press). While the Copenhagen interpretation assumes that the wave function continues to propagate and finally collapses through physical observation, which can certainly influence the outcome of an observation (see double-slit experiment), von Neumann and Wigner assume that the collapse of the wave function can occur at any point between the measuring device and the consciousness of the observer or the measuring instrument. This can be described by a thought experiment by Wigner, called "Wigner's friend." In this variation on the famous Schrödinger experiment, Wigner interposes a friend who is supposed to tell him whether Schrödinger's cat is alive or dead after returning to the laboratory, which he had left in the meantime. The question that now arises is: Was the state of this system - which is in the superposition dead cat/sad friend vs. alive cat/happy friend - only determined when Wigner experienced and consciously perceived the result, i.e. the state of the cat, or did the result already manifest itself at an earlier point in time (Wigner, 1995)? According to this interpretation, there is therefore a connection, an interaction, between the state of the quantum object and the

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measuring instrument, i.e. the consciousness of the observer. According to Wigner, the consciousness of the observer is the limit that causes the above-mentioned collapse of the wave function. Unfortunately, it is so far physically impossible to prove or substantiate this thesis, as the postulate already implies that this phenomenon is outside the physical realm. Although in this interpretation the rules of quantum mechanics and classical interpretations such as the Copenhagen interpretation are not considered wrong, they can only describe the material world, but the mind of a human being cannot be captured by quantum mechanics (Wigner, 1963). There are therefore phenomena that go beyond what can be explained by the classical Copenhagen interpretation.

This includes the human mind and its interaction with the measurement and the effect to be measured. In other words, the interaction between mind and matter. And this is where the phenomenon of micro-psychokinesis, which is central to this study, comes into play.

Micro-psychokinesis

Micro-psychokinesis also includes the assumption that there is an interaction and mutual influence between the observer and the quantum object. It bridges the gap between physics and human consciousness.

"Psychokinesis also refers to situations where statistical deviations from chance in probabilistic systems, such as tumbling dice or coin tosses, are observed to correlate with participants' wishes or intentions for a particular outcome" (Varvoglis & Bancel, 2016, p.3).

This mysterious connection between man and matter has fascinated mankind for centuries. Even great philosophers such as Descartes thought about it and were certain, for example, that the mood of the player could have a positive effect on the course of a game of dice (quoted from Davidenko & Thill, 1990). In the early stages of this branch of psychokinesis research

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experiments, for example, were designed for participants to move tables or other objects using only the power of thought (Varvoglīs & Bancel, 2015). Micro-psychokinesis, on the other hand, refers to the same phenomenon, but on a much smaller and more subtle scale. As vividly summarized by Varvoglīs and Bancel in 2015: "minute influences on inanimate, probabilistic systems, producing effects that can only be detected through statistical means" (Varvoglīs & Bancel, 2015). Compared to psychokinesis, their effects can only be detected through statistical methods (Varvoglīs & Bancel, 2016), such as influencing a random number generator - a method that was used in the study for this bachelor's thesis. Since the 1960s, (quantum) random number generators have increasingly become the standard method of micro-psychokinesis research (Jahn, Dunne, & Jahn, 1980). This process was accompanied by the development of quantum theoretical explanations for micro-psychokinesis (Schmidt, 1970). Although these theories have existed for a very long time and research has been conducted in this area for decades, there are still many doubts and contradictory opinions about micro-psychokinetic effects in today's science and also a lot of literature that could not find or replicate these effects (Maier, Dechamps, & Pflitsch, 2018) or postulates that the effects found are due to publication bias (Bösch, Steinkamp, & Boller, 2006). In the following study, quantum random number generators are also used to find out whether micro-psychokinesis actually exists. For this purpose, erotic and neutral images are presented to unknowing test subjects using the aforementioned quantum random number generator. On the basis of the quantity of erotic images viewed at the end, statistical methods will be used to determine whether an influence on the

quantum random number generator has taken place or not. And this will be used to check whether micro-psychokinetic effects have occurred.

Aims and hypotheses of the study

As already mentioned, the aim of the study was to demonstrate the micro-psychokinetic effects of showing erotic images. That is, whether the process of seeing a random set of erotic images can be directed and subconsciously influenced, and thus individuals or groups of individuals see a different set of erotic images than a random generator would determine. In order to test this, several hypotheses were put forward to make the abstract process of micro-psychokinesis visible and testable. To this end, several groups of people were defined in the sample at the beginning of the study. The number of erotic images seen by these test participants was compared with the random number of erotic images using Bayesian one-sample t-tests. A total of six hypotheses were formulated to test this.

Hypothesis one postulated that test subjects who consume pornographic content more frequently in their private lives will see more erotic images during the study than chance. This formulation was chosen because it was assumed a priori that this group of people only consumed pornography for pleasure. They have a healthy relationship to their own sexuality and pornography - in other words, they are neither addicted to consuming pornography nor ashamed of their consumption. Due to this positive attitude towards their pornography consumption, this group should see more erotic images, because erotic content is something that subjects in this sub-sample like to see and therefore also subconsciously want to see more often.

In hypothesis two, it is assumed that satisfied singles see more erotic images than chance would determine, as they are happy with their condition.

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and they lack nothing, they have no perceived lack, and they do not influence the number of images viewed in the negative direction. Dissatisfied singles, on the other hand, according to hypothesis three, see fewer erotic images due to the perceived lack. The formulation of these hypotheses is based on the assumptions of a previous study (Maier & Dechamps, in press). Here, nicotine-dependent smokers and non-addicted non-smokers were examined in a setting similar to that used in this research. Smokers and non-smokers saw neutral images or images of cigarettes projected by a quantum randomizer, similar to the study described in this thesis. A priori speculations regarding the influence of the test subjects on this random process were based on the assumption that smokers are subject to an unconscious craving for cigarettes due to their nicotine addiction. Due to their addiction, they are unconsciously at the mercy of a process of "*perceived deprivation*". This means that they implicitly and subconsciously crave nicotine all the time, but can never get enough of it due to their addiction. This subconscious process should therefore - according to Maier and Dechamps' theory - cause them to see fewer cigarette pictures than chance would dictate. The subconscious state of constant deprivation thus manifests itself in the random experiment through an actual reduction in the number of images of smokers - a so-called *self-fulfilling prophecy*. Analogous to these assumptions, hypotheses two to six were also formulated for the research work described here.

A similar pattern emerges for the fourth and fifth hypotheses: The assumption for hypothesis four is that people who are satisfied in their relationships will see more erotic images in the study than chance, as there is no perceived lack for them either. While people who are dissatisfied with their relationship, according to hypothesis five, see less erotic image material due to the perceived lack of

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than chance. Hypothesis six postulates, also based on the principle of perceived lack, that people who are addicted to Internet pornography see fewer erotic images than chance. The justification for this type of formulation of the hypothesis is analogous to the formulation of hypotheses two to five and is most comparable to the justification for the hypothesis formulation by Maier and Dechamps. This is because here, too, we are dealing with addicted subjects who experience a perceived lack due to their addiction and therefore see fewer images of the desired addictive substance due to the phenomenon of *self-fulfilling prophecy*.

Method

Participants and Procedure

The data for testing these hypotheses was collected via the online survey portal SoSci Survey and carried out by the participants on their own computers from home. A PC or laptop was required to conduct the study; participation via smartphone was not possible. All questions were designed as necessary, so that each participant had to answer all questions to avoid missing data. Participants were informed that they were taking part in a study on the effects of consuming erotic images.

A total of 686 participants completed the questionnaire on SoSci Survey. However, only data from 633 participants could be analyzed. People who admitted in the post-task that they had not looked at the pictures or had given dishonest information were eliminated so as not to jeopardize the validity of the study. For the same reason, asexual test subjects and people who gave false age information were also not included in the calculations.

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The age of the participants ($N = 633$) ranged from 18 to 62 years, with a mean of 25.78 ($SD = 5.86$). 35% of participants identified as female, 64% as male and 1% of participants did not identify as either gender. 86% of subjects identified as heterosexual, 6% identified as homosexual and a further 6% as bisexual. The highest level of education attained was a university degree for 51% of the participants. 40% of the participants had a high school diploma, 4% had completed an apprenticeship, 3% had a secondary school diploma and less than 1% had a lower secondary school diploma or no recognized qualification.

57% of participants were in a relationship at the time of the survey, 43% stated that they were single. Of those who were in a relationship, 92% said they were satisfied or very satisfied with their relationship, 8% were dissatisfied or only somewhat satisfied. Of the people who were not in a relationship, 44% were satisfied with their relationship and 56% were dissatisfied with being single.

The sample studied consisted of adults who were at least 18 years old. had reached the age of 18. The study was designed as an online study. The reason for this was that a wider range of participants could be reached. It was also hoped that questions on the sensitive topic of sexuality and pornography consumption would be answered more truthfully if no experimenter was involved. In this way, an attempt was made to reduce social desirability. The study link reached the participants mainly via the internet. It was shared on several social media platforms. In order to reach people of all genders, age groups and sexualities, the link was distributed in several groups on the social media platform Facebook - these included groups dealing specifically with psychological topics and studies, as well as lesbian event groups or

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Student groups. The link was also distributed via word of mouth, the WhatsApp messenger, friends, family and fellow students at the Ludwig Maximilian University of Munich, as well as via contacts at the Medical Faculty of the Julius Maximilian University of Würzburg.

After answering demographic questions, the participants were allowed to complete part of the CPUI questionnaire on addiction to Internet pornography (see material), and they also answered questions about their pornography consumption and their attitude towards pornography in general. Subsequently, the subjects were presented with erotic images that corresponded to their sexual orientation. For this purpose, they were randomly shown 50 images that either depicted erotic content or neutral stimuli in the form of everyday objects, such as a cup, cutlery or an umbrella. All participants then answered questions in the post-task about how seriously they had taken the study and whether they had answered the questions truthfully. These answers were used in the further process to exclude people who had lied and thus distorted the results from the sample in order to obtain as objective a picture as possible of the research question. Finally, two questions were asked about the participants' self-efficacy (see material), although these are not relevant to the research question being addressed here. They were asked additionally in order to investigate an important question for another study with a similar background.

Material

The aim of the study was to determine whether certain people or groups of people viewed more or less of these erotic images.

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images than the random generator determines. In other words, whether the randomization process can be influenced by people's attitudes towards pornography and factors that affect these attitudes.

To a large extent, the online questionnaire consisted of self-compiled questions on demographic data and attitudes towards pornography. For example, the participants' gender, age, sexual orientation and marital status were of interest. In addition to the relationship status, satisfaction with the relationship was also recorded in order to test the above-mentioned hypotheses regarding the amount of erotic images viewed. Furthermore, questions on educational status, country of origin and religious affiliation were answered by the participants. With regard to attitudes towards pornography, the participants were asked nine questions, each of which could be answered on a 5-point Likert scale, labeled from "strongly disagree" to "strongly agree". Participants were also asked whether they had ever consumed pornography from the internet. If they answered yes to this question, further questions were asked about the type, duration and frequency of consumption. After the subjects had viewed the images, a post-task was carried out to assess how seriously and attentively they had participated in the study and how honestly they had answered the questions on this sensitive topic. This served to remove people from the sample who had not actively and attentively participated in the study, for example who had not looked at the pictures, in order to avoid a bias in the sample and to obtain a representative picture of the facts.

With regard to the erotic images and in order to find out more about the participants' Internet pornography consumption, the participants were asked whether they were addicted to the consumption of online pornography. To determine this, the *Cyber Pornography Use Inventory*, or CPUI for short, was used.

CPUI (Grubbs, Sessoms, Wheeler, & Volk, 2010)

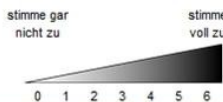
The inventory created by Grubbs and colleagues consists of 31 items, which are divided into three subscales. On 5- to 7-point Likert scales, respondents provide information about themselves and their own behavior regarding the consumption of Internet pornography. The subscales deal exclusively with the consumption of online pornography and related emotions, and not with general sexual behavior on the Internet. This makes the CPUI one of the few questionnaires that is limited to the consumption of Internet pornography only and does not ask about general sexual behavior on the Internet (Eleuteri, Tripodi, Petruccelli, Rossi, & Simonelli, 2014). Due to the fact that this study is exclusively concerned with the consumption of pornography on the Internet and not with other online sexual activities, the CPUI was therefore used for this study. The CPUI is also a well-founded and valid inventory. In a review from 2016, the self-perceived pornography addiction of adults was examined. In the course of this, ten articles were inspected that used various methods to measure this construct.

It was found that of all the pornography addiction questionnaires examined, the CPUI was the only inventory that included control questions on social desirability. Even when the measurements were controlled in this direction after these questions, significant results were still obtained with the CPUI (Duffy, Dawson, & Das Nair, 2016). The *addictive patterns* subscale of the CPUI inventory used has good internal consistency with a Cronbach's alpha of $\alpha = .89$ (Eleuteri et al., 2014). The CPUI also includes two other subscales, the *Guilt Scale* and the *Social Scale*, which deal with emotions and behaviors associated with online pornography addiction. As these aspects were not relevant in the present study, these scales were not asked.

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The study was conducted in German and 92% of the participants stated that their home country was Germany. This means that the majority of the test subjects (N= 634) were native German speakers. Therefore, a version of the CPUI translated from English into German was used for better comprehensibility, as can be seen in Figure 3.

1. Die folgenden Statements beziehen sich auf Ihren Pornographiekonsum im Internet.
Bitte geben Sie an, inwiefern Sie diesen Aussagen zustimmen.

stimme gar nicht zu  stimme voll zu
 0 1 2 3 4 5 6

Es kommt vor, dass ich mir meinen Tagesablauf so einrichte, dass ich Zeit habe mir Pornographie anzusehen.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich stehe früher auf oder gehe später ins Bett als andere in meinem Haushalt, um mir ungestört Pornographie ansehen zu können.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich sage Freunden ab oder nehme an sozialen Aktivitäten nicht teil, um mir stattdessen Pornographie anzusehen.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich schiebe wichtige Aktivitäten (z.B. Lernen) auf, um mir Pornographie anzusehen.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich vermeide Situationen, in denen mein Pornographiekonsum aufgedeckt oder thematisiert werden könnte.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich befürchte, jemand könnte eines Tages meinen geheimen Pornographiekonsum entdecken.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich versuche den Inhalt meines Computers oder Bildschirms vor anderen zu verstecken.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich bleibe bis spät in die Nacht auf, um Internetpornographie anzusehen.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich nutze eine Suchmaschine, um Pornographie zu finden.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich befriedige mich selbst, während ich mir Pornographie im Internet ansehe.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich glaube, ich bin süchtig nach Internetpornographie.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich habe kein Problem, meinen Konsum von Internetpornographie zu kontrollieren.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich kann nicht damit aufhören, Pornographie im Internet anzusehen.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Selbst wenn ich keine Internetpornographie ansehen möchte, fühle ich mich stark dazu hingezogen.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Es fällt mir leicht, auf eine Gelegenheit zu verzichten, in der ich Internetpornographie ansehen kann.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Ich fühle mich ängstlich, wütend oder enttäuscht, wenn ich keine Möglichkeit habe, Internetpornographie anzusehen.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Beizeiten benutze ich Internetpornographie als Belohnung für das Erledigen von Aufgaben.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Pornographie hat mitunter Auswirkungen auf bestimmte Aspekte meines Lebens.	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>

Figure 3: Illustration of the German form of the CPUI as presented to the subjects, with a 7-point, graphically anchored response scale.

General Self-Efficacy Scale (Jerusalem & Schwarzer, 1979)

Two questions on self-efficacy, taken from the *General Self-Efficacy Scale*, also known as GSE, were asked at the end of the participant survey. The original scale consists of ten items, which are answered on a 4-point Likert scale. The answer options are labeled and range from "strongly disagree" to "strongly agree". The two items on self-efficacy were not relevant for the

Micro-psychokinetic effects with erotic image material

They were collected for a study that deals with and processes other questions using the same data set. For the sake of completeness, the measurement instrument used is nevertheless listed.

Erotic images

The micro-psychokinetic effects were to be investigated with the help of erotic images. The erotic images required for this were adapted to three sexualities in order to reach as many test subjects as possible with such a variety. A total of four sets of stimuli were therefore created. The first set consisted of neutral stimuli, which were not intended to evoke an emotional response in the viewer and had already been used in previous studies (e.g. Maier & Dechamps, in press). These stimuli were taken from the *International Affective Picture System* (IAPS) - a system designed to provide sets of normative emotional stimuli that can be used in research on attention processes and emotions. The database includes standardized color photographs that cover a comprehensive range of categories and different valence stimuli (Lang, Bradley, & Cuthbert, 1997).

The second set of images included erotic stimuli designed for a heterosexual audience. These photographs also came from the IAPS database. The third set consisted of images depicting lesbian pornography. Since no suitable images were available in the IAPS or any other database, these images were obtained from various license-free websites on the Internet. The same procedure was used for the fourth image set, which depicted gay pornography. Image sets three and four were reviewed and validated by several people of each sexuality prior to use in the study in order to create the most appropriate and normative set of erotic images for each of the groups. After some modifications, two image sets were created that were approved by all pre-testers of the respective sexuality groups.

orientation were perceived as erotic and therefore corresponded in quality to image sets one and two.

Results

The aim of the study was to determine whether a directional influence on the random process is possible and takes place based on the number of erotic images viewed by a person compared to the randomly determined number of erotic images. Bayesian one-sample t-tests were used to test this. However, before a bayesian one-sample t-test could be carried out, a cut-off value had to be determined for one of the hypotheses. This was hypothesis 1 regarding the participants' frequency of online pornography consumption.

Determining the cut-off value

In this hypothesis, it was postulated that test subjects who view Internet pornography more frequently see more erotic images than chance. For this purpose, the test subjects were asked how often they view pornography on the Internet on average. The answers were given on a 7-point scale. The answers were given on a 7-point scale: "several times a day", "daily", "several times a week", "about once a week", "several times a month", "about once a month" and "less often" [than once a month]. Can be seen in Figure 4.

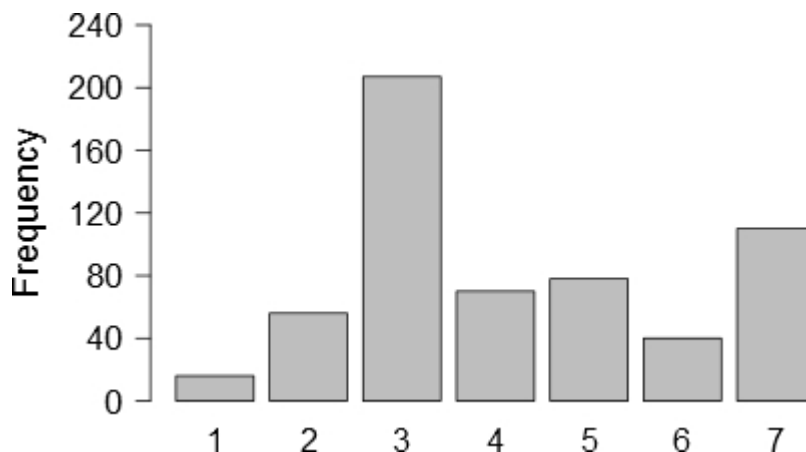


Figure 4: Bar chart showing the distribution of the frequency of online pornography consumption in the overall sample. On the y-axis the number of people, on the x-axis the categories of frequency of pornography consumption, where 1 = "several times a day", 2 = "daily", 3 = "several times a week", 4 = "about once a week", 5 = "several times a month", 6 = "about once a month", 7 = "less often"

Since the hypothesis of interest only involved test subjects who actually consume Internet pornography frequently in accordance with generally accepted social guidelines, a cut-off value had to be determined on the basis of which the "frequent" online pornography consumption could be separated from "normal" to "low" Internet pornography consumption. As the empirical evidence on this topic is very thin at the current state of research and no findings and studies exist, particularly with regard to Internet pornography, personal assessments of frequent pornography consumption were used. In a 2006 study, it was shown that male test subjects consume pornography significantly more frequently than female test participants (Hald, 2006). One aspect of the This certainly gave rise to further ideas and considerations regarding the interpretation of the hypothesis and the setting of the cut-off value. Nevertheless, these findings could not be applied to the sample surveyed, as the aforementioned study only surveyed people between the ages of 18 and 30, whereas the sample used here included people between the ages of 18 and 62. Furthermore, this study focused primarily on gender differences in pornography consumption, rather than on

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the absolute frequency of consumption. The fact that the 2006 study did not pay particular attention to online pornography, but only to the consumption of pornographic material of any kind, also contributed to the fact that the findings could not be used for our purposes.

Therefore, we made our own considerations and finally chose a value that was compatible with the perceived social opinion of frequent pornography consumption. In the end, the cut-off value was set at 4 - "about once a week". This means that people who fell below this value, i.e. who stated that they consumed online pornography several times a week, daily or even several times a day (scale values 1, 2, 3), belonged to the sub-sample that frequently consumed pornography (N = 277, 6.14% female). While people who stated that they consumed Internet pornography once a week or less (scale values 4, 5, 6, 7) were categorized in the group of people who do not frequently consume pornography on the Internet. This group was not relevant for the hypothesis under investigation and was therefore not considered, but was included again in the other hypotheses, which did not depend on the frequency of Internet pornography consumption. In the group of people who frequently consume pornography online, people were also excluded if they had a total score of more than four on the CPUI scale and were therefore considered to be addicted to Internet pornography. The reason for this was that the addicted persons were to be examined in a special hypothesis. In addition, it was also assumed a priori that people who frequently consume pornography purely for pleasure exhibit different behaviors than people who actually consume a high amount of pornography due to addiction. To avoid distortions, these two groups were therefore considered separately and differentiated for hypotheses one and six.

Bayesian one-sample t- tests

Bayesian one-sample t-tests were conducted to test all hypotheses using the open-source statistics program JASP (version 0.8.6). A one-tailed Bayesian one-sample t-test was calculated for each hypothesis, with the amount of erotic images viewed as the dependent variable (AV). Bayesian hypothesis testing has several advantages over frequentist statistical methods, which are often used in current research to test hypotheses. Among other things, it allows prior knowledge from previous studies to be included in the current test in the form of a prior. Prior knowledge therefore exists as a fixed parameter in the calculation and can be included in conclusions together with the new data (Gspöner et al., 2014). Another positive point of the Bayesian method is the Bayes factor itself. Among other things, it embodies the comparison of how well two hypotheses can predict the data. The hypothesis that predicts the observed data better is the one that is supported by more evidence. Thus, the Bayes factor is based purely on the probability of the observed data. This in turn means that nothing other than these data, the sample size and the prior can influence it (Goodman, 1999). This is a clear advantage over the classic p-value, which can also be influenced by events that are directly and indirectly related to the data or the calculation of the p-value.

Test Value.

Based on the assumption of the hypotheses that under certain circumstances people see more or fewer images with erotic content than chance, the *test value*, i.e. the value of erotic images seen by chance, was set at 25. This value was chosen because each participating test subject saw a total of 50 images, both neutral and neutral, during the course of the study.

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erotic images. This number of images was determined before the start of the study and was the same for each participant. Since a random distribution of images assumes a 50:50 chance of seeing either erotic or neutral images, the numerical value 25 was chosen. This is the stochastic expected value of the distribution of the type of images.

Bayes factor and Cauchy level.

In order to determine the quality of the sample data obtained, the Bayes factor is calculated in the course of a Bayesian one-sample t-test. The Bayes factor describes the probability distribution for an effect size. It is used to quantify the support of the data for one of the hypotheses or alternatives. Thus, as mentioned above, the Bayes factor can be used instead of a p-value as a measure of the strength of evidence for a hypothesis. The Bayes factor incorporates prior knowledge about the facts postulated in the hypothesis in the form of a prior (Goodman, 1999). A rather low Cauchy level of .1 was already defined before the data collection with regard to the assumption about the distribution of the effect size resulting from the prior knowledge. This distribution characterizes the prior. The statistical software JASP used for the analysis assumes a relatively high Cauchy level of $r = .707$ by default. However, it is known from past studies that micro-psychokinetic effect sizes are very weak. This is a very understandable phenomenon when you consider that micropsychokinetic effects are also very weak in everyday life and that a person cannot influence the environment by, for example, moving a table using the power of thought, but through much more subtle and unconscious mechanisms. Therefore, a lower Cauchy level is more likely to lead to safe effects in this type of study (Bem, Utts, & Johnson, 2011; Maier et al., 2014). Therefore, based on this evidence, the relatively small prior of $r = .1$ was assumed and set. To

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A Bayesian *sequential analysis* with a Bayes factor BF_{10} was used in JASP to present the results. The factor BF_{10} was chosen because the hypotheses used in this study were formulated in such a way that the alternative hypothesis (H_1) is the one of interest. With the Bayes factor BF_{10} , graphs and values of the Bayes factor in the individual hypotheses are aligned in such a way that a valid presentation is possible.

Hypothesis 1

In the first hypothesis, it was postulated that people who consume pornography on the Internet more frequently see more erotic images in the experiment than chance. To test this postulate, a right-sided Bayesian one-sample t-test was calculated. As described above, the *test value* was set to 25, the *cauchy scale* was set to .1 and the Bayes factor BF_{10} was used. In this subsample, individuals who had high scores on the CPUI subscale *addictive patterns* and were therefore considered to be addicted to online pornography were also removed. The reason for this was that these individuals were to be specifically examined in hypothesis six. In order to avoid bias, and because frequent pornography consumption was not equated with addiction, these two groups of people were separated in the corresponding hypotheses.

There were 277 people in this sub-sample of people who frequently consumed Internet pornography. This group of subjects showed a mean value of 25.06 erotic images viewed ($SD = 3.35$). This resulted in a one-sided BF of 2.01 in the direction of the H_0 . This showed an anecdotal effect in the direction of the null hypothesis. It is therefore 2.01 times more likely that the null hypothesis is true than the alternative hypothesis based on the data obtained. As a result, the original

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postulated alternative hypothesis can be rejected. People who frequently consume online pornography therefore do not see more erotic images than chance. The following graphic shows the *sequential analysis* of the Bayes factor for people who frequently consume Internet pornography (see Figure 5).

Sequential Analysis

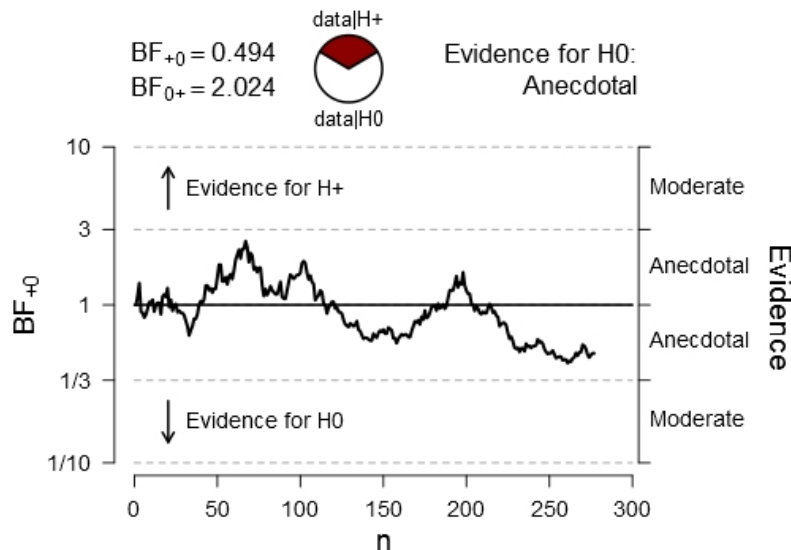


Figure 5 describes the sequential analysis for hypothesis 1: The curve in the figure describes the fluctuations in the BF in the group of people who frequently consume pornography online, over the time of the survey and over the process of including more information in the analysis by testing additional test subjects. Overall, there is an anecdotal effect in the direction of the null hypothesis.

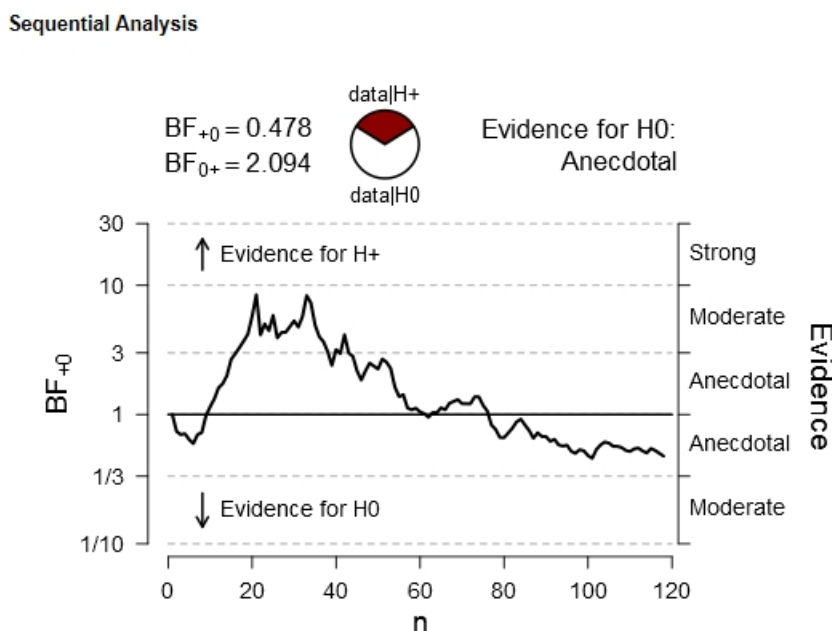
Hypothesis 2

The second hypothesis postulates that happy singles see more erotic images than chance. Again, a Bayesian one-sample t-test was carried out. Due to the formulation of this hypothesis, the test was right-sided. The *test value* was again set at 25, the *cauchy scale* at .1 and a *BF* of 10 was again used. There were 118 happy singles in the sample. With a *BF* of 2.08, the Bayesian t-test analysis revealed an anecdotal effect in the direction of the H_0 . The mean value of the erotic images seen in this sub-sample was $M = 24.98$, $SD = 3.38$. Based on the sample data collected, it is therefore 2.08 times more likely that the null hypothesis applies. Thus, on the basis of the data

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It cannot be confirmed that happy singles see more erotic images than chance. In the following figure, the *sequential analysis* of the Bayes factor for the sub-sample of happy singles is graphically illustrated (see Figure 6).

Figure 6 describes the sequential analysis for hypothesis 2: The curve in the figure describes



the fluctuations of the BF in the group of happy singles over the time of the survey and over the process that more information is included in the analysis by testing additional test subjects. Overall, there is an anecdotal effect in the direction of the null hypothesis.

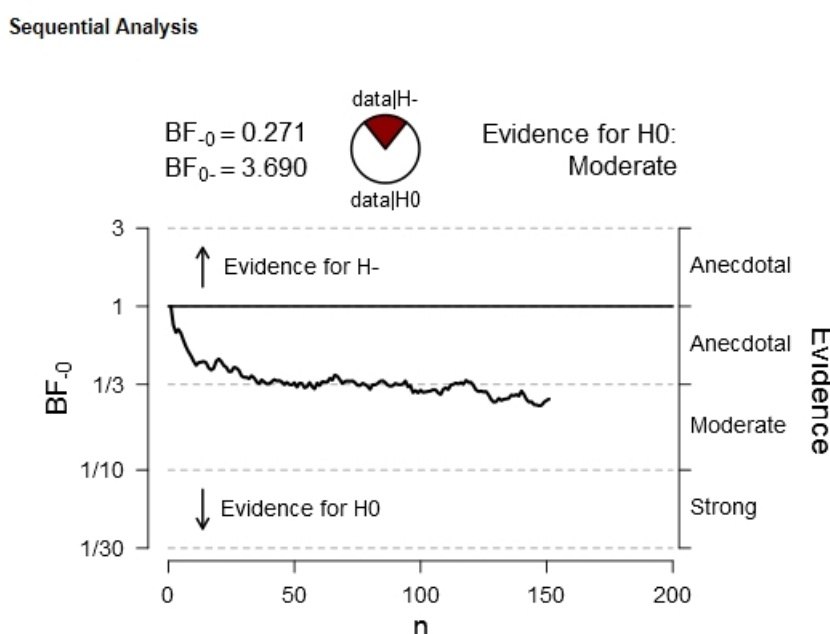
Hypothesis 3

Hypothesis three was based on the fact that people who are unhappy with being single see fewer erotic images than chance. To test this assumption, a left-sided Bayesian one-sample t-test was conducted. In this hypothesis test, the *test value* and *cauchy scale* as well as the Bayes factor were also set to the same values as in the previous analyses. The *test value* was therefore set at 25, the *cauchy scale* was set at .1 and the Bayes factor BF_{10} was again used. The Bayesian one-sample t-test analysis with 151 unhappy singles resulted in a *Bayes factor* of

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3.68 in the direction of H_0 . On average, people in this sub-sample $M = 25.33$ saw erotic images ($SD = 3.64$). With the help of the information obtained from the *Bayes factor*, it is therefore 3.68 times more likely that the null hypothesis applies on the basis of this data. This suggests a moderate effect towards the null hypothesis. It can therefore not be assumed that the fact postulated in the original hypothesis that unhappy singles see fewer erotic images is true. This is illustrated in the following diagram (see Figure 7).

Figure 7 describes the sequential analysis for hypothesis 3: The curve in the figure describes



the fluctuations of the BF in the group of unhappy singles over the time of the survey and over the process of including more information in the analysis by testing additional test subjects. Overall, there is a moderate effect in the direction of the null hypothesis.

Hypothesis 4

In hypothesis four, it was assumed that people in happy relationships see more erotic images than chance. A right-sided Bayesian one-sample t-test analysis was again conducted with *test value 25*, *cauchy scale .1* and *BF10*. The 224 happily coupled individuals comprising the sample saw on average $M = 24.80$ erotic images, $SD = 3.44$. The *sequential analysis* revealed a

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Bayes factor of 3.87 in the direction of H_0 . This means that there is a moderate one-sided effect in the direction of the null hypothesis and, based on the data obtained, it is 3.87 times more likely that the null hypothesis applies. This means that the originally postulated alternative hypothesis cannot be confirmed in this case either. It can therefore not be assumed that people who are happy in their relationships see more erotic images than chance. This is illustrated in the diagram below (see Figure 8).

Sequential Analysis

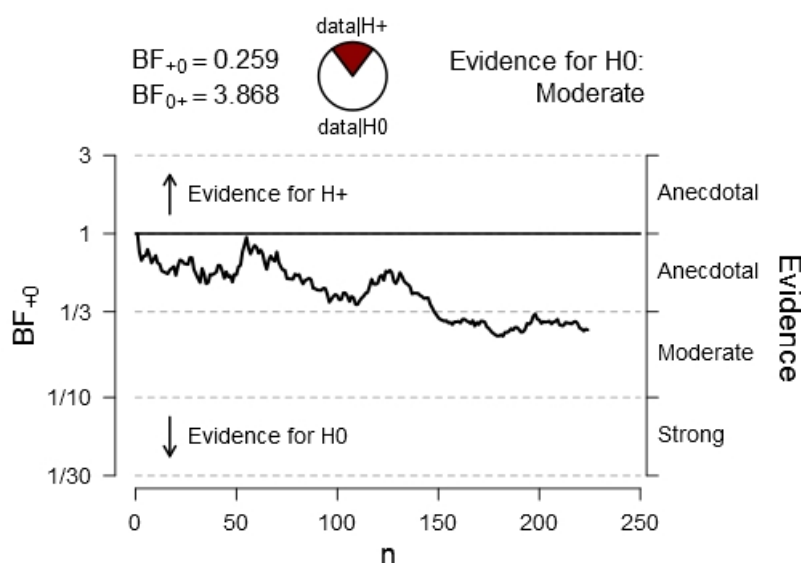


Figure 8 describes the sequential analysis for hypothesis 4: The curve in the figure describes the fluctuations of the BF in the group of people in happy relationships over the time of the survey and over the process that more information is included in the analysis by testing additional test subjects. Overall, there is a moderate effect in the direction of the null hypothesis.

Hypothesis 5

In the fifth hypothesis of this study, it was postulated that people in unhappy relationships see fewer erotic images than chance. A left-sided Bayesian one-sample t-test with *test value* 25, *cauchy scale* .1 and *BF10* was also carried out to test this hypothesis.

There were 139 people in the sub-sample used for this, and the test participants saw a total of

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The *sequential analysis* for this question revealed a moderate effect in the direction of H_0 with a *Bayes factor* of 4.46. This is the strongest effect that could be found in this study. Therefore, the original assumption that people who are dissatisfied with their relationship see fewer erotic images than chance must also be rejected for this hypothesis. This is because, based on the data collected, it is 4.46 times more likely that the null hypothesis is correct. The results of this analysis are illustrated in the following graph (see Figure 9).

Sequential Analysis

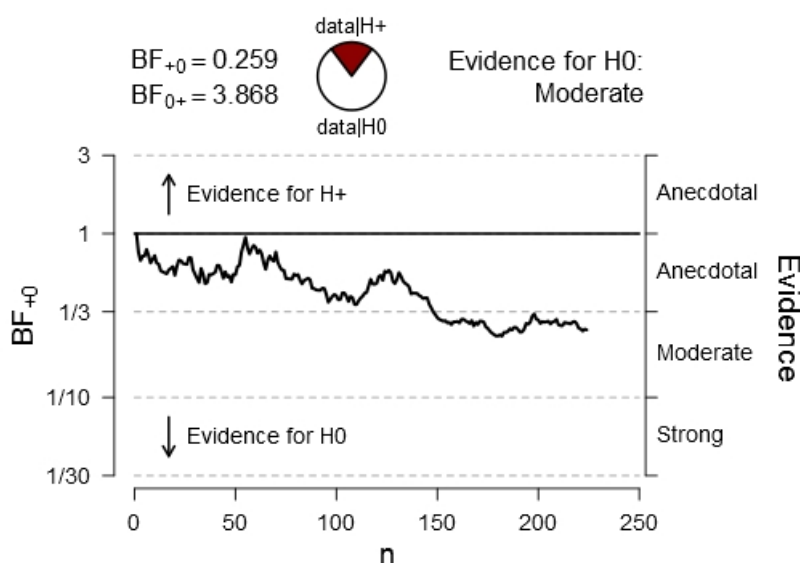


Figure 9 describes the sequential analysis for hypothesis 5: The curve in the figure describes the fluctuations of the BF in the group of people in unhappy relationships over the time of the survey and over the process that more information is included in the analysis by testing additional test subjects. Overall, there is an anecdotal effect in the direction of the null hypothesis.

Hypothesis 6

In the sixth and final hypothesis of this thesis, it was postulated that pornography addicts view fewer erotic images than chance. Online pornography dependence was assessed using the *addictive patterns* subscale of the CPUI.

For this purpose, the total score on the CPUI scale of the *addictive patterns scale*

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to determine which people had an Internet pornography addiction. As there is no clinical cut-off value or a specific norm in the literature as to when, according to this scale, an online pornography addiction can be said to exist (Eleuteri et al., 2014; Grubbs et al., 2010), a cut-off value was again determined here on the basis of our own considerations. The answers could be given on a 7-point scale, ranging from 0 to 6 (0 = "strongly disagree", 6 = "strongly agree"). The cut-off value was set at 5. People who received a score of 4.9 or a score below 4.9 were classified as not addicted to Internet pornography.

People who achieved a total score of 5 or higher were included in the sub-sample of online pornography addicts. As it was assumed a priori that there would be few online pornography addicts in the sample, the cut-off value was set so low that all pornography addicts could be identified. To this end, it was accepted that a person who did not fully meet the criteria might be labeled as an Internet pornography addict. At the beginning, there were considerations to set the cut-off value for this hypothesis even lower.

However, this suggestion was then rejected. As the value 3 would be the average value on the 7-point scale from 0 to 6, it seemed inappropriate to use the value 4 as a cut-off value, as it is close to the mean value of the scale and with such a low value it is very likely that many non-addicted people would be identified as addicted.

Descriptively, it can be seen that erotic images were seen in the subsample of Internet pornography addicts $M = 26.33$ ($SD = 5.12$) (see Figure 10).

Descriptives

Descriptives

	N	Mean	SD	SE
sums	3	26.333	5.132	2.963

Figure 10: Descriptive data of the subsample of people who are addicted to online pornography.

Note. N = number of people in the sub-sample, Mean = mean value of erotic images seen in the sub-sample, SD = standard deviation, SE = standard error

Due to the small and therefore unrepresentative sample of $N = 3$, this hypothesis was not interpreted or discussed further. The small number of test subjects in this sub-sample does not allow any representative and empirically substantiated statements to be made with regard to this hypothesis. Although the descriptive result appears promising because, as can be seen from the descriptive mean value, it deviates more strongly from the *test value* 25 than the descriptive mean values of the previous hypotheses, an interpretation is not appropriate and a representative statement is not possible. For this reason, hypothesis six is not listed further and is not equated with the other hypotheses. Only when it is explicitly mentioned that hypothesis six is meant is it included in the following conclusions and statements. If hypothesis six is not explicitly mentioned, only those hypotheses are meant which could be statistically meaningfully evaluated - i.e. hypotheses one to five.

All hypotheses

A clear one-sided trend towards H_0 can be observed for all postulated hypotheses. These effects towards H_0 were anecdotal to moderate. Thus, none of the assumed alternative hypotheses could be confirmed on the basis of the data situation in the individual

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sub-samples were confirmed. Thus, based on these data and the formulated hypotheses, there are no indications of micro-psychokinetic effects.

Discussion

The aim of this study was to use the number of images with erotic content viewed, which were projected by a quantum random number generator, to determine whether test subjects can influence this random process in a directed manner and thus whether the number of erotic images viewed deviates from chance. For this purpose, the subjects conducted an online study in which they answered a series of items and viewed images that were randomly selected by a quantum random number generator for each trial. Erotic and neutral stimuli each had a 50% probability of being selected. Before the observation by the respective test subject took place, the two alternatives should coexist in a state of superposition and their occurrence should be equally probable. The measurement procedure in the study assumed that the subject unconsciously preferred one of the two states (erotic or neutral material), depending on their subconscious desires, and thus observed one type of image more frequently. Based on the results of the *sequential analysis* of the individual hypotheses of this study, no significant deviations from chance in the previously assumed and postulated directions of the individual groups can be recognized. Based on these results, it cannot be assumed that the subjects of the study are able to influence the highly developed quantum random number generator in the direction of "non-randomness" simply by passively observing the images. Thus, it could not be proven that a directed influencing of a random process by micro-psychokinesis exists. However, descriptively

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Deviations from chance on the basis of the mean values. This is an issue that should be investigated in more detail in further studies.

The sample size of $N = 633$ can be seen as a limitation and a possible reason for the non-significant results of the study. Although this is generally a sufficient number to reliably determine effects, the sample was divided into various sub-samples for testing the individual hypotheses ($N_1 = 279$, $N_2 = 118$, $N_3 = 151$, $N_4 = 224$, $N_5 = 139$). These sometimes very small numbers of test subjects may not have been sufficient to achieve a significant effect in the hypotheses tested.

As none of the six hypotheses became significant, the question arises post-hoc as to how the results and the *Bayes factor* would have turned out if the hypotheses had been formulated differently. The reason for the formulation of the hypotheses in this study are findings from a previous study (Maier & Dechamps, in press). In this study, nicotine-dependent people were examined and the number of stimulus-laden images they saw was compared with a control group of non-addicted non-smokers. It was found that the addicted subjects saw fewer images of cigarettes.

A priori, a so-called "perceived lack" was proposed as the cause of this phenomenon. As the nicotine addicts felt that they never had enough cigarettes due to their addiction, this reduced the amount of images of cigarettes seen during the study, as in a *self-fulfilling prophecy*. As already mentioned, in the study on which this thesis is based, it was assumed that people in unhappy relationships, for example, see fewer erotic images. The reason for this was assumed a priori to be the same *perceived lack* as in the study by Maier and Dechamps. Due to their dissatisfaction with the relationship, the people concerned feel a lack in their partnership. This feeling of emptiness is reflected in

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the lower number of erotic images they see during the study. The other hypotheses were formulated in the same way. Another example of this is hypothesis five. Here it is assumed that people who are unhappy in their existing relationship see fewer erotic images than chance. It was assumed a priori that a *perceived lack* is also plausible for this group of people, analogous to the justifications for the other hypotheses. However, as the results of the study described in this paper showed, these effects could not be found and therefore none of the hypotheses could be confirmed. The following limitations can be cited as possible reasons for this: Apparently, the formulation of the hypotheses was not optimal for the chosen research question. Equating people in unhappy relationships, or even unhappy singles, with people suffering from nicotine dependence and equating the hypotheses and speculations of both groups meant that the results of Maier and Dechamps could not be replicated in this study. Based on the formulations used, a sample with different demographics should have been selected in order to achieve significant and optimal results. As anecdotal to moderate effects towards the null hypothesis were consistently found in the tests of the individual hypotheses in the study discussed here, it is likely that stronger effects in the desired directions would have occurred with sufficiently large sub-samples and a different formulation of the hypotheses. This is also supported by the descriptive data of the individual hypothesis calculations. Based on the mean values of the hypotheses, it can be shown that, at least descriptively, there is a deviation from the *test value* 25 and thus from chance ($M_{1,H} = 25.06$, $M_{2,H} = 24.97$, $M_{3,H} = 25.32$, $M_{4,H} = 24.80$, $M_{5,H} = 25.25$). On the basis of the

However, it is not possible to say whether the deviations found are due to power, sample size, chance or other factors.

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influencing factors have arisen or not arisen. Exploratory post-hoc analyses, which worked with the opposing hypotheses, were used to investigate this further. Two hypotheses showed anecdotal effects for the alternative hypothesis investigated. This affected hypothesis three and hypothesis five. The original formulation of hypothesis three was "Unhappy singles see fewer erotic images than chance." No significant effect could be found for this in the *sequential analysis* of the original evaluation. If one now works exploratory in the JASP software, and based on the descriptive mean value of $M = 25.32$, which suggests the opposite, with the reformulated hypothesis: "Unhappy singles see more erotic images than chance.", a *Bayes factor* of $BF = 1.06$ can be recorded in the direction of the newly formulated alternative hypothesis (see Figure 11).

Sequential Analysis

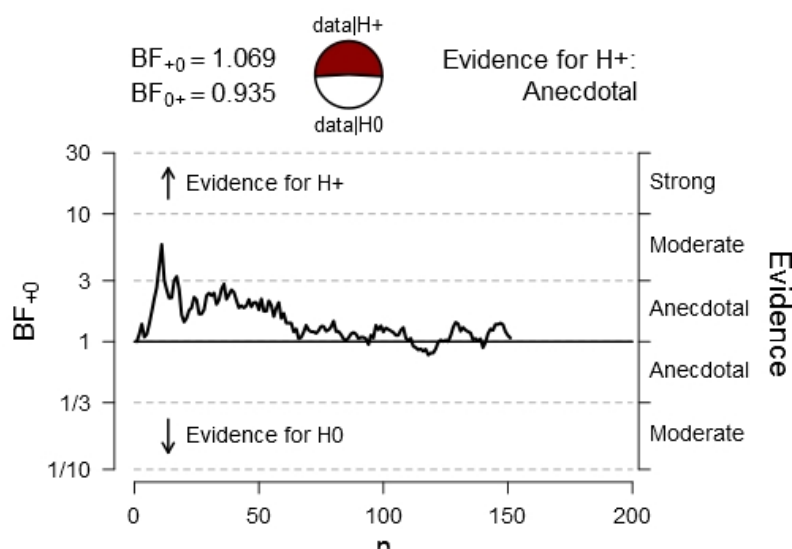


Figure 11 describes the exploratory post-hoc sequential analysis for hypothesis 3. The curve in the figure describes the fluctuations in BF in the group of unhappy singles and shows the anecdotal effect for the alternative hypothesis in a post-hoc analysis with a reformulated hypothesis.

This means that if the hypothesis had been formulated differently, there are indications that it could have become significant if the hypothesis had been reformulated.

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Unhappy singles therefore actually see more erotic images than chance, which suggests a micro-psychokinetic influence. However, since only an anecdotal effect is present, future studies should work with larger sub-samples so that reliable significant effects can be found and not just clues pointing in a certain direction. Hypothesis five: "People in unhappy relationships see fewer erotic images than chance." an anecdotal effect for the alternative hypothesis was found in a post-hoc analysis with a reformulated hypothesis. Analogous to the reformulation of hypothesis three, this was formulated as follows: "People in unhappy relationships see more erotic images than chance." When the sample data were analyzed under this formulation using a Bayesian one-sample t-test, anecdotal effects with a $BF = 2.09$ for the alternative hypothesis were also found here, as with hypothesis three (see Figure 12).

Sequential Analysis

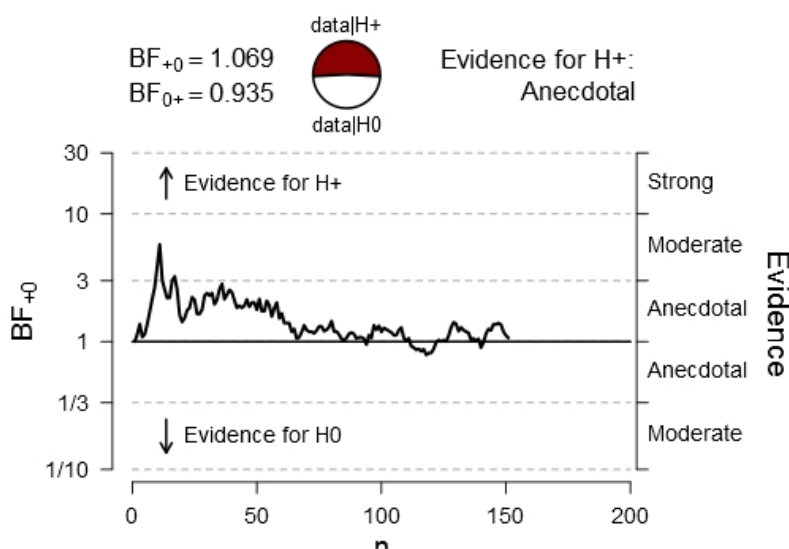


Figure 12 describes the exploratory post-hoc sequential analysis for hypothesis 5. The curve in the figure describes the fluctuations in BF in the group of people who are unhappy with their relationship and shows the anecdotal effect for the alternative hypothesis in a post-hoc analysis with a reformulated hypothesis.

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This means that, analogous to the exploratory analysis of hypothesis three, a reformulation of hypothesis five also suggests that if the hypothesis had been formulated differently in the main study, it would have shown at least an anecdotal *Bayes factor* towards the expected alternative hypothesis.

However, no effects in the direction of the alternative hypothesis could be identified for the other three originally tested hypotheses when reformulated in the same way as hypothesis three and hypothesis five. Hypothesis six was not investigated post-hoc due to the small sample, as it was not to be expected that a reformulation would produce evaluable and generally applicable results.

In summary, this means that even in an exploratory post-hoc study, none of the hypotheses were clearly significant, and no directional influence of chance could be proven.

Nevertheless, on the basis of the results of the post-hoc analysis, further investigation of this issue is appropriate, and future research should work with newly formulated hypotheses in order to be able to determine the effect sought, or to be able to rule it out with certainty.

Another limitation, which particularly affects hypothesis one, was the choice of the CPUI as a measurement instrument. In the hypothesis for which it was used, a different measurement instrument might have been more productive. For the study, the CPUI scale was used, which had high factor loadings on the instrument's *addictive patterns scale*. This was used to determine whether the test subjects were addicted to Internet pornography. However, hypothesis one was not specifically tailored to addicted individuals, but only aimed at frequent Internet pornography consumption. Also, the sample included almost only people who frequently consumed pornography online but were not addicted to it. Therefore, a different measurement tool might have been more useful for this type of question and demographic. Although in hypothesis six a

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The hypothesis was based on the assumption about pornography addicts, i.e. a question for which the CPUI is a good measuring instrument, but the proportion of actual addicts in the sample surveyed was so small that this hypothesis could not be evaluated due to non-representativeness. The sample should therefore have included a different group of people so that hypothesis six could have been tested reliably and with a sufficient number of test subjects. This point of criticism should also provide impetus for future research.

In conclusion, it can therefore be summarized that no micro-psychokinetic effects can be found on the basis of the data obtained in this study and its evaluation. Nevertheless, a descriptive tendency can be derived from the mean values, which deviate from chance for each of the hypotheses tested, that despite the non-significant results of the Bayesian one-sample t-tests, micro-psychokinetic effects could exist and that these deviations are not only due to random fluctuations. These assumptions are also partially supported by post-hoc studies, which were able to find anecdotal effects for two of the reformulated hypotheses. Future research should therefore be conducted on this issue with newly considered and reformulated hypotheses. Although this study could not explicitly prove that micro-psychokinetic effects exist and occur, it could not be completely ruled out that the sought-after effects could occur with a different formulation of the hypotheses and larger subsamples. It is therefore important to continue research in order to either significantly prove or conclusively disprove the finding of micro-psychokinetic effects. Further research on this topic and the issues discussed could also provide useful practical applications for everyday life. It is always an advantage to know about one's own inner needs. Micro-psychokinesis could

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be a new, promising method for gaining access to these same people. For example, in couples counseling to determine the extent to which patients are dissatisfied with their relationship, or in working with addictions of various kinds. For example, to identify certain addictions with the help of *perceived lack* and micro-psychokinesis. And who knows - perhaps the sentence "I see what I lack" will soon become a guideline for a better lifestyle.

Literature

- Baumann, K. (2013). *Die Deutungen der Quantentheorie*: Springer-Verlag.
- Bem, D. J., Utts, J., & Johnson, W. O. (2011). Must psychologists change the way they analyze their data?, 716-719.
- Bohr, N. (1928). The quantum postulate and the recent development of atomistics. *Natural Sciences*, 16(15), 245-257.
- Bohr, N. (1935). Can quantum-mechanical description of physical reality be considered complete? *Physical review*, 48(8), 696-702.
- Born, M. (1926). Quantum mechanics of collisions. *Journal of Physics*, 38(11-12), 803- 827.
- Bösch, H., Steinkamp, F., & Boller, E. (2006). Examining psychokinesis: The interaction of human intention with random number generators--A meta-analysis. *Psychological bulletin*, 132(4), 497-537.
- Camejo, S. A. (2006). *Skurrile Quantenwelt*: Springer-Verlag.
- Davidenko, D., & Thill, B. (1990). *I think, therefore I am: Descartes' dissolute life; novel*: Eichborn.
- Duffy, A., Dawson, D. L., & Das Nair, R. (2016). Pornography addiction in adults: A systematic review of definitions and reported impact. *The journal of sexual medicine*, 13(5), 760-777.
- Einstein, A., Podolsky, B., & Rosen, N. (1935). Can quantum-mechanical description of physical reality be considered complete? *Physical review*, 47(10), 777-780.
- Eleuteri, S., Tripodi, F., Petrucelli, I., Rossi, R., & Simonelli, C. (2014). Questionnaires and scales for the evaluation of the online sexual activities: A review of 20 years of research. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 8(1), 1-11.

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Goodman, S. N. (1999). Toward evidence-based medical statistics. 2: The Bayes factor.

Annals of internal medicine, 130(12), 1005-1013.

Greenberger, D. M., Horne, M. A., & Zeilinger, A. (1993). Multiparticle interferometry and the superposition principle. *Physics Today, 46*, 22-22.

Grubbs, J. B., Sessoms, J., Wheeler, D. M., & Volk, F. (2010). The Cyber-Pornography Use Inventory: The development of a new assessment instrument. *Sexual Addiction & Compulsivity, 17*(2), 106-126.

Gsponer, T., Gerber, F., Bornkamp, B., Ohlssen, D., Vandemeulebroecke, M., & Schmidli, H. (2014). A practical guide to Bayesian group sequential designs. *Pharmaceutical statistics, 13*(1), 71-80.

Hald, G. M. (2006). Gender differences in pornography consumption among young heterosexual Danish adults. *Archives of sexual behavior, 35*(5), 577-585.

Heisenberg, W. (1985). On the descriptive content of quantum-theoretical kinematics and mechanics *Original Scientific Papers Original Scientific Papers* (pp. 478-504): Springer.

Hertz, H. (1887). On the photoelectric effect. *Ann Phys, 31*, 983-1000.

Jahn, R. G., Dunne, B. J., & Jahn, E. G. (1980). Analytical judging procedure for remote perception experiments. *The Journal of Parapsychology, 44*(3), 207.

Jerusalem, M., & Schwarzer, R. (1979). The general self-efficacy scale.

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1997). International affective picture system (IAPS): Technical manual and affective ratings. *NIMH Center for the Study of Emotion and Attention, 39*-58.

Maier, M. A., Büchner, V. L., Kuhbandner, C., Pflitsch, M., Fernández-Capo, M., & Gámiz-Sanfeliu, M. (2014). Feeling the future again: retroactive avoidance of negative stimuli. *Journal of Consciousness Studies, 21*(9-10), 121-152.

Micro-psychokinetic effects with erotic image material

Maier, M. A., & Dechamps, M. C. Observer Effects on Quantum Randomness: Testing Micro-psychokinetic Effects of Smokers on Addiction-related Stimuli.

Maier, M. A., Dechamps, M. C., & Pflitsch, M. (2018). Intentional Observer Effects on Quantum Randomness: A Bayesian Analysis Reveals Evidence Against Micro-Psychokinesis. *Frontiers in Psychology, 9*, 379.

Schmidt, H. (1970). A PK test with electronic equipment. *Parapsychol, 34*, 175-181.

Schrödinger, E. (1935). The present situation in quantum mechanics. *Natural Sciences, 23*(49), 823-828.

Varvoglis, M., & Bancel, P. A. (2015). Micro-psychokinesis. *Parapsychology: A handbook for the 21st century*, 266-281.

Varvoglis, M., & Bancel, P. A. (2016). MICRO-PSYCHOKINESIS: EXCEPTIONAL OR UNIVERSAL? *The Journal of Parapsychology, 80*(1), 37-44.

Wigner, E. P. (1963). The problem of measurement. *American Journal of Physics, 31*(1), 6-15.

Wigner, E. P. (1995). Remarks on the mind-body question *Philosophical Reflections and Syntheses* (pp. 247-260): Springer, 171-184