

## Emotional Reactions to some Illusions in Show Magic: An Exploratory Study

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### Abstract

*The basis of this article is a conference presented in Marseille on April, 2nd, 2019, for the MUCEM (MUSée des Civilisations de l'Europe et de la Méditerranée / MUseum of European and Mediterranean Civilizations). This paper presents a exploratory study conducted in Rennes (France), about emotions evoked by three stage illusions presented in show magic: (1) "Sawing in half" illusion, (2) "Escaping a straitjacket" illusion, (3) "Harrow" illusion. Results of a free association task show that the chosen illusions are perceived to produce different emotions, but mainly the negative ones. Results reveal, too, that the illusions evoked are differently evaluated on their perceived attractiveness and their perceived danger. Results show a link between the illusions, the perception of danger, and the fascination they generate. Propositions for future research are formulated, at different levels of analysis: individual and psychosocial.*

**Keywords:** Emotions, Show magic, Illusions, Social psychology

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### Preliminary remarks

In January 2019, I was contacted by French philosopher Jacques Serrano to give a conference for the MUCEM about the « *Fascination for magic tricks that involve an imminent death* ». Well, I was not convinced that all spectators were fascinated in the same way by different illusions, nor that this fascination were linked to an apparent imminent death. I can easily think that in the early ages for example, the scenery of a person (or a duck) first beheaded, and then restored by "wizardry" could fascinate people. I can easily think too, that in those times these effects activated the idea of death and produced great emotions. But nowadays, I really doubt that people react this way, because of the diffusion on the one hand, of scientific knowledge and, on the other hand, of techniques of magic<sup>1</sup>. Today, at least in western countries most people know that "there is a trick", as French people say. The techniques of magic are now largely published on TV or on the Internet (for example see *The Masked Magician*). People know that the male or female assistant is not really cut in half, or impaled. But the request of the MUCEM questioned me. I wondered about the emotions that people could feel when they watch different illusions. I had no data about this topic, and a search in the scientific literature puzzled me: I found nothing about this topic. So, I began to think about the way I could approach this issue. In

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<sup>1</sup>I think that this diffusion began with the book *The discoverie of Whitchcraft* (Reginald Scot, 1584).

the same time Clémentine Tranchet, a student of mine, began to work with me on this topic. In my opinion it was out of question to present a conference without having any data, but the delay between the request and the conference was very short. So, I decided to conduct in this short time a preliminary study, which I conceived as the cornerstone of the future ones, which would be much more standardized.

### Scientific context of the study

If psychologists study the art of magic since the late 19th century (see e.a. Binet, 1894; Thomas et al., 2016, 2019), a renewed interest emerged in the late 1990's with the publication of the book *Magic in Theory* (Lamont & Wiseman, 1999). Nowadays most of the publications about magic rely to cognitive psychology (for a review see Kuhn, 2019) and neurosciences (see Parris et al., 2009; Macnick et al., 2010). So, authors mainly investigate the psychological or neurological mechanisms underlying the perception of magic tricks, thereby elaborating a so-called "science of magic" (Kuhn, 2019; Lamont et al., 2010; Rensink & Kuhn, 2015; see too the "Science Of Magic Association"). But to our knowledge, very few studies focus (directly or not) on social psychological processes/phenomena, for example the question of gender in magic (Nardi, 1988, 2010), social value attributed to the magician (Le Barbenchon et al., 2005; Morchain, 2019a; Morchain, 2019c), gendered representations of magic in the internet (Morchain, 2019b), or practices of magicians (Rissanen et al., 2014). So, the present paper takes place in the field of social psychology, and develops some reflexions about the emotional reactions of the audience in some situations of theatrical or show magic (called below "magic"<sup>2</sup>).

When experiencing magic, people react emotionally. According to the presentation or to the kind of magic presented, they can express surprise and laughter, but they also can cry or even express fear. They can, too, feel wondered. In my experience as a part-time professional magician, I observed that French audiences could express irritation too, especially in the case of close-up magic. In his show "La mémoire du temps" ("Memory of time"), the Canadian magician Alain Choquette presents French audience as very logical, Cartesian, positioning itself in competition with the magician. So, the reactions of an audience may be culturally- dependent. Otherwise, adults are not the only ones to react emotionally when facing magic. It seems that emotions appear very early in babies when their expectancies are violated. In that case they express surprise (Wang et al., 2004) and could be pleased by an unexpected event (Scherer et al., 2004). Of course, a magic show is rather different and more complex, more sophisticated than the situations presented to babies in psychological labs, especially because it involves human beings labelled as "magician" or "female magician", who are presumably responsible of the appearance, disappearance, levitation, transformation etc. of an object or another human being. What is important for us is that emotions seem to appear very early when humans are confronted to unexpected events. Anyway, magic triggers emotions. But does magic trigger a specific emotion, as stated by magician and director Claude De Piante (Universciences, 2018), or does it trigger different emotions?

In this paper, we investigate which emotions adult people evoke when they think about different illusions, called by magicians "illusions", "stage illusions", or "big scale illusions". Some of these illusions are clearly faked and do not imply an apparent danger nor the death of the person (for example, the assistant is apparently cutted in half -ore even more pieces). Other illusions may be dangerous, or at least may be perceived as dangerous. They even can be perceived as deadly ones (for example, as Houdini performed: escaping a "water torture cell" or escaping a straitjacket while tied by the ankles to a crane). In such situations, indeed magicians play with the emotions of the audience (Houdini did so; and see for example, too, the Dayle Krall's teaser on YouTube). These illusions may be perceived as dangerous or lethal but to our knowledge, magicians very rarely die while performing

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<sup>2</sup>In my point of view, "*theatrical magic*" refers to magic as a tool in a theatrical context (e.g. a play), whereas "*show magic*" refers more to magic per se, may be more classically performed. In the first case, the magician is an actor playing a role, in the second case; he performs as himself (e.g. "David Copperfield"). Of course, that could be not as dichotomous, these two frames may largely overlap. Indeed, French magician Robert-Houdin stated: "*a magician is an actor playing the role of a magician*".

their act (see Wikipedia for the list of entertainers who died during a performance)<sup>3</sup>. Magician Harry Houdini died after receiving four strokes in the abdomen that finally caused peritonitis (October 1926, 31th), but that punches were not given during his magical performance in a theatre. Probably the well-known death of a magician is that of William Ellsworth Robinson, aka Chung Ling Soo. He died on March 1918, 24th, after a stage accident in the illusion he called “*Condemned to Death by the Boxers*” (a “catching a bullet” illusion). In such a moment, most probably spectators will react with great emotions, especially because of a crowd effect. But in the case of Chung Ling Soo, it seems that people were completely stunned: “silence swept through the hall” (Vox, 1918). Anyway, to conclude it seems clear that death, or what is related to it, fascinates the humans (Holmes, 2002; Lee et al., 2013; Penfold-Mounce, 2010, 2016; Ragon, 1981). So, another question is: does the idea of death fascinate people, even in theatrical situations? Are people fascinated, even if they know that they are watching show magic? Would they be fascinated the same way when watching different illusions? The present study focuses, too, on this topic.

What are emotions? Numerous definitions can be found in the scientific literature (Kleinginna & Kleinginna, 1981). As Damasio (1995) writes:

“emotion is the combination of a mental evaluative process, simple or complex, with dispositional responses to that process, mostly toward the body proper, resulting in an emotional body state, but also toward the brain itself {neurotransmitter nuclei in brain stem}, resulting in additional mental changes. Note that, for the moment, I leave out of emotion the perception of all the changes that constitute the emotional response. As you will soon discover, I reserve the term feeling for the experience of those changes” (p.139).

Tcherkassof and Frijda (2014) define emotions as “bodily stances, expressing one’s relationship towards the emotional object” (p.502). So according to these definitions, the present study focuses on feelings.

Which emotions do really feel the audience in a magic show is rather unclear, because it probably depends on cultural factors, social factors, presentation and type of illusion. But magic is supposed to provoke joy, pleasure, surprise, and sometimes fear but, as Leddington states: “there has been no systematic examination of the nature of the pleasure we take in watching magic performance” (2017:34). Some information can be found in natural settings (e.g. observing the reactions of audiences), or in magic literature (even it does not relate directly -or only- to emotions, see Delord, 1971, 1972, 1973, Nelms, 1984; Ortiz, 1994, 2006; Tamariz, 2000). But the current psychological literature about this topic seems little developed (Lamont, 2017; Leddington, 2017; see Wiseman & Watt, 2018, for the link between magic and well-being which, may be, could be linked to emotions). Moreover, when studying the emotions in magic, at least two levels of analysis have to be distinguished: the individual and the social<sup>4</sup> one. In the present study, as people evoked the emotions that they could feel, we clearly refer to the first level of analysis.

As previously said the aim of the present study was to begin an investigation about the emotions spontaneously associated when different illusions are evoked, and to describe the potential link between the attractiveness of illusions, its perceived danger and the risk of the performer’s death. So, we conceived this study as a first step in the investigation of the link between illusions and emotions.

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<sup>3</sup>In his memoirs (1868, pp122-124 French edition), Robert-Houdin mentioned the death of Giovanni (son of the magician “Torrini”) in the stage presentation of “*The son of William Tell*”. In this effect, the boy holds an apple between the teeth. A spectator shoot at him with a gun, and the ball normally lodge in the fruit (p.90, English edition). Recently, the news mentioned the death of the Indian magician Chanchal Lahiri during a water-escape show (*Ouest-France*, 18/06/2019; see too, CNN)

<sup>4</sup>This latter term has different meanings (see for example Hogg & Abrams, 1988 ; McGuire, 1986:102-103). “Social” could refer to the presence of others, to the social valence and signification of the emotions, to conformism, to convergence to each other, to social comparison, to cultural norms and values, etc.

## Participants

62 psychology students following their 3rd year License (i.e. Bachelor) in the University Rennes2 answered a short questionnaire during a tutorial session. Because we did not formulate any hypothesis about their sex and age, they were not asked to indicate these variables.

## Procedure

The framework of this study was clearly presented as the “*field of theatrical or show magic*”. The order was: “*Firstly, please write down the emotions you could feel when you see each magical illusion below*”. The illusions proposed were: (1) “*Sawing a woman in half*”<sup>5</sup>, (2) “*Escaping a straitjacket*”, (3) “*Harrow*”<sup>6</sup>. We chose a priori these illusions, because the first one is known since a long time<sup>7</sup> to be an illusion and does not implies danger, while the others ones might be seen as dangerous or lethal. Moreover, they might be not perceived as magic tricks. Each illusion was shortly verbally described. The “*Sawing in half*” was described as “*the illusion in which a person enters a box and then is sawed in two parts*”. The “*Evasion*” was described as “*the illusion in which the person is in a straitjacket and hung by the ankles at 20 meters height*”. Finally, the “*Harrow*” was described as “*the illusion in which the person is tied up, or is in a box above which is a Harrow. After a moment the Harrow falls*”. Lay readers in the field of magic will find below a picture of each illusion (source: internet). But remember that the participants of the present study did not see any picture.



Illustration 1: The three illusions evoked (Sawing a woman in half<sup>8</sup>, Escaping a straitjacket<sup>9</sup>, Harrow<sup>10</sup>)

After answering the free association task, participants were asked to check if each illusion was (1) “*Fascinating*”, (2) “*Intriguing*”, (3) “*Dangerous*”, (4) “*Death risked*”, (5) “*Would you spontaneously say “that’s rigged!”?*”. For each item, they answered on 11 points Likert scale (0 = Not at all; 10 = Absolutely).

<sup>5</sup>This denomination may seem a sexist one, and its interesting to question the denomination and presentation of stage illusions. But it is the one widely used in French language. It refers to the creation of this illusion by P.T.

Selbit (see footnote #7). In this paper, we called it “*sawing in half illusion*”

<sup>6</sup>This illusion comes in different versions and is also called “*Spiker illusion*”.

<sup>7</sup>Robert-Houdin reports in his memoirs (1868, p118 French edition) that the magician Torrini presented this illusion (here, a scissiparity) for the sultan Selim III, who was in charge between April 7<sup>th</sup>, 1789 and May, 29<sup>th</sup>, 1807. The reader can find (Wikioo.com) the painting “*A lady sawn in half by two Venetian magicians*” by Jan Van Grevenbroeck (1731-1807). But the magician P.T. Selbit is known to have given the first public

<sup>8</sup>Magician Howard Thurstone (<http://www.stageillusion.com/news/articles-by-paul-kieve/alive-at-both-ends-Sawing-a-woman-in-half>).

<sup>9</sup>Magician Harry Houdini (<http://www.themagicdetective.com/2011/12/houdini-straight-jacket-history-more.html>).

<sup>10</sup>“*Harrow illusion*” (large scale stage illusion, also known as “*Spiker illusion*”); <https://www.malloymodernmagic.com/proddetail.php?prod=SubSpiker>

## Results

### Emotions evoked. Content analysis

Participants spontaneously evoked between 0 and 6 emotions (Mean=1.58; SD=1.26; Median=1). The means of emotions evoked by the three illusions do not differ from each other (all  $p > .216$ ).

The emotions were first analyzed a posteriori by the first author of this paper who wanted, as previously said, to present the results during his conference. Then, one other judge categorized the emotions. Its task was to “group the emotions that go together”. In other words, no psychological model of emotions was used for this task. Results present below the final analysis of the two judges.

Firstly, they do not differ in their categorization of spontaneous answers: “Sawing in half” illusion ( $\text{Chi}^2(10)=7.641$ ,  $p=.663$ ); “Escaping a straightjacket” illusion, ( $\text{Chi}^2(9)=13.899$ ,  $p=.126$ ); “Harrow” illusion ( $\text{Chi}^2(17)=15.482$ ,  $p=.561$ ).

A first analysis of the participants’ answers indicates that some of these indeed refer to emotions, some refer to a questioning, and some are not specified. The Table 1(a,b,c) below presents these different types of answers. We labelled these answers as (1) “negative emotions”, “positive emotions”, “no emotion”, (2) “cognitive answer” (namely, questioning, looking for a solution etc.), (3) “unspecified answers”.

Emotions	Sawing in half	Escaping	Harrow
<b>Negative emotions</b>	<b>46</b>	<b>56</b>	<b>83</b>
Fear	27	35	51
Stress	8	19	21
Pain	4	1	6
Discomfort, Uneasiness	0	0	3
Disgust	6	0	2
Lassitude, Boredom	1	1	0
<b>Positive emotions</b>	<b>6</b>	<b>4</b>	<b>4</b>
Relief	0	0	3
Fun	5	1	1
Hope	0	1	0
Pity	0	1	0
Empathy	1	1	0
<b>No emotion</b>	<b>21</b>	<b>0</b>	<b>2</b>
<b>TOTALS</b>	<b>73</b>	<b>60</b>	<b>89</b>

Table 1a: Emotions clearly cited, and their valence

Cognitive Answers	Sawing in half	Escaping	Harrow
Danger	2	3	2
Looking for a solution	14	5	5
Curiosity	6	5	3
Confusion	1	1	1
Intrigued	0	1	3
Anticipation	0	1	1
<b>TOTALS</b>	<b>23</b>	<b>16</b>	<b>15</b>

Table 1b: “Cognitive” answers

Unspecified answers	Sawing in half	Escaping	Harrow
Impressed	8	8	5
Excitation	1	1	1
Fascination	7	4	2
Surprise	21	5	8
<b>TOTALS</b>	<b>37</b>	<b>18</b>	<b>16</b>

Table 1c: Unspecified answers

Note that, even if surprise is sometimes conceived as an emotion (Ekman, 1982; Izard, 1977), we categorise here it as an unspecified answer, because surprise may be conceived as positive (my friends welcome me at home to celebrate my birthday) or negative (a robber is in my living room). More important, we don't know what participants mean by "surprise".

To summarize, firstly the three illusions do not differ in terms of the participants' "cognitive answers" (Table 1b,  $Chi^2(2)=1.606$ ,  $p=.45$ ). But one can notice that the "Sawing in half" illusion seems to generate more a search for a solution than the other illusions.

Secondly, the three illusions do not differ in terms of the participants' "unspecified" emotional answers (Table 1c,  $Chi^2(6)=5.181$ ,  $p=.521$ ). But one can notice that the "Sawing in half" illusion seems to generate much more surprise than the two others.

Thirdly, the illusions clearly differ in the emotions that they are supposed to generate (Table 2,  $Chi^2(4)=42.032$ ,  $p<.000001$ ).

Emotions	Sawing in half	Escaping	Harrow	TOTALS
Negative emotions	46	56	83	185
Positive emotions	6	4	4	14
No emotions	21	0	2	23
<b>TOTALS</b>	<b>73</b>	<b>60</b>	<b>89</b>	<b>222</b>

Table 2: Valence of the emotional answers

One can observe that the illusions do not differ in terms of positive emotions. So we excluded these emotions for the computation. Results show that the "Sawing in half" illusion is supposed to trigger no emotions, and differs from "Escaping a straitjacket" and "Harrow"

illusions. These latter illusions, especially the "Harrow" illusion, are supposed to generate more negative illusions than the "Sawing in half" illusion (Table 2,  $Chi^2(2)=41.544$ ,  $p<.000001$ ).

## Evaluation of the Illusions

Because some participants didn't answer all questions, the statistical analysis covers 59 people.

Firstly the items "Fascinating" and "Intriguing" measure the same construct ( $r=.77$ ,  $p<.00001$ ; *Cronbach alpha*=.865); and the items "Dangerous" and "Death risky" too ( $r=.80$ ,  $p<.00001$ ; *Cronbach alpha*=.885). So, we aggregate the participant's answers to constitute two indexes, respectively called "Attractiveness" and "Danger". Thereby the estimations may vary between 0 and 20. We will first present the global analysis on these indexes, then we will develop the analysis on each item, because we think that can provide clarification. Otherwise, we will present separately the results on the item "Would you spontaneously say "that's rigged!"".

The ANOVA (repeated measures) reveals first two main effects: the first a main effect of the variable "illusions" ( $F(2,116)=17.89$ ,  $p<.0001$ ), the second of the repeated measures ( $F(1,58)=24.38$ ,  $p<.0001$ ). More important, it reveals an interaction between these two variables ( $F(2,116)=13.11$ ,  $p<.0001$ ). So, we conducted an ANOVA and a post-hoc unplanned *Scheffé's* test for each index.



The three illusions evoked do not differ on the index “Attractiveness” ( $F(2,174)=2.05$ ,  $p=.13$ , Scheffé’s test all  $p$ ’s $>.12$ ). But they differ on the index “Danger” ( $F(2,174)=24.77$ ,  $p<.000001$ ). More precisely, the illusion “Sawing in half” differs significantly from “Escaping a straitjacket” (Scheffé’s test=6.50,  $p<.01$ ) and from “Harrow” (Scheffé’s test=5.59,  $p<.01$ ), which do not differ (Scheffé’s test=.91,  $p=.66$ ; see Figure 1 below).

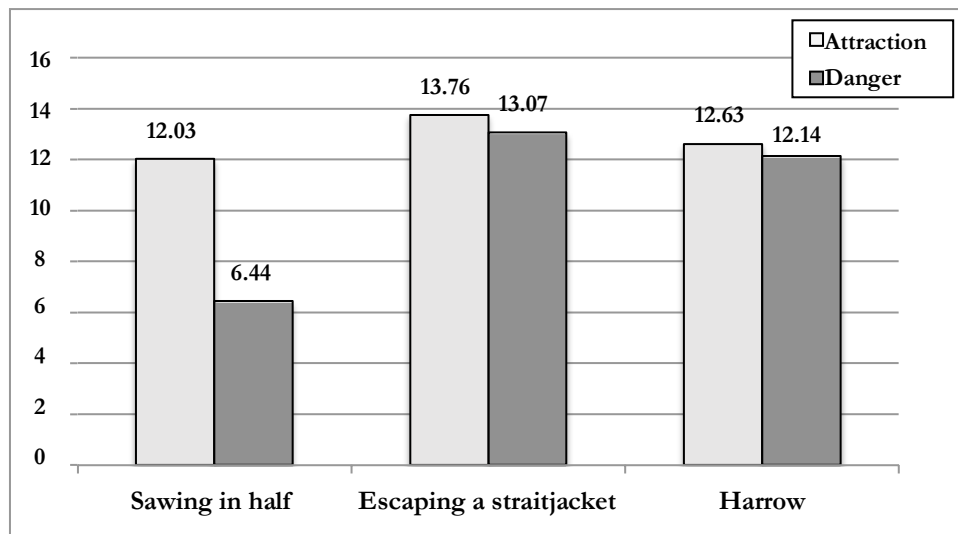


Figure 1: Attractiveness (index) and danger (index) perceived of the 3 illusions evoked

In other words, these three illusions are perceived as equally attractive. But the “Sawing in half” illusion is perceived as less dangerous than the two others, which are perceived as equally dangerous.

Remember that the perception of danger, or of death, is conceived to attract people. In the present study, is the attractiveness of the illusion linked to the perception of its danger? We conduct a regression analysis with the index “Danger” as predictor and the index “Attractiveness” as variable. Results show that the more participants perceive danger in the illusion, the more they find it attractive ( $R^2=.10$ ;  $F(1,175)=19.72$ ,  $p<.00001$ ; equation of the regression line:  $y=.2416x + 10.26$ ).

Finally, results show that the participants’ answers to the item “*Would you spontaneously say ‘that’s rigged?’*” differ according to the illusion evoked ( $F(2,174)=6.4$ ,  $p=.002$ ). The “Sawing in half” illusion significantly differs from “Escaping a straitjacket” (Scheffé’s test=3.474;  $p=.003$ ) and from “Harrow illusion” (Scheffé’s test=2.476;  $p=.049$ ; respectively  $M=9.44$ ,  $SD=1.49$ ;  $M=7.97$ ,  $SD=2.78$ ;  $M=8.39$ ,  $SD=2.44$ ), which do not differ from each other (Scheffé’s test=.998;  $p=.61$ ). In addition this item is not related to the perceived attractiveness index ( $r=.0446$ ,  $p=.56$ ) and is negatively related to the danger index ( $r=-.21$ ,  $p=.005$ ). In other words, the “Sawing in half” illusion is perceived as more rigged than the two other illusions. Moreover, the more participants think that “there is a rigging”, the less they perceive the illusion as dangerous.

### Analysis on each item: Post-Hoc tests

As previously said, in order to precise the analysis, a Scheffé’s unplanned post-hoc test was calculated for each item. Its results are presented below.

**Intriguing:** The three illusions do not differ significantly ( $F(2,174)=.83$ ,  $p=.044$ ; Scheffé’s test: all  $p$ ’s $>.449$ ;  $M=6.6$ ,  $SD=2.39$ ). The illusions are perceived as equally intriguing.

**Fascinating:** The “Sawing in half” tendentiously differs from “Escaping a straitjacket” (Scheffé’s test= 2.43,  $p<.055$ ; respectively  $M=5.68$ ,  $SD=2.96$ , and  $M=6.85$ ,  $SD=2.26$ ), but does not differ from “Harrow” (Scheffé’s test= .84,  $p=.70$ ;  $M=6.08$ ,  $SD=2.58$ ), which does not differ from “Escaping a straitjacket” (Scheffé’s test= 1.58,  $p<.29$ ). The “Sawing in half” is perceived as less fascinating than

“Escaping a straitjacket” but as equally fascinating than “Harrow”. These later illusions are perceived as equally fascinating.

**Dangerous:** The “Sawing in half” significantly differs from “Escaping a straitjacket” (Scheffé’s test=6.35;  $p<.00001$ ) and from “Harrow illusion” (Scheffé’s test=5.204;  $p<.00001$ , respectively  $M=3.89$ ,  $SD=3.25$ ;  $M=7.19$ ,  $SD=2.13$ ;  $M=6.59$ ,  $SD=2.94$ ), which do not differ from each other (Scheffé’s test=1.146;  $p=.52$ ). The “Escaping a straitjacket” and “Harrow” illusions are perceived to be more dangerous than the “Sawing in half” illusion.

**Death Risk:** The “Sawing in half” significantly differs from “Escaping a straitjacket” (Scheffé’s test=5.84;  $p<.00001$ ) and from “Harrow illusion” (Scheffé’s test=5.251;  $p<.00001$ ; respectively  $M=2.54$ ,  $SD=2.81$ ;  $M=5.88$ ,  $SD=2.99$ ;  $M=5.54$ ,  $SD=3.47$ ), which do not differ from each other (Scheffé’s test=.593;  $p=.838$ ). The “Escaping a straitjacket” and “Harrow” illusions are perceived to be more death risky than the “Sawing in half” illusion.

### Complementary results

During the debriefing time of the first session, some participants expressed that the familiarity of the illusion could be an important variable to be taken into account. As this remark seemed very pertinent, in the subsequent sessions we added this item (participants  $N=50$ ). Results show that the familiarity depends on the illusion evoked ( $F(2,146)=20.05$ ,  $p<.000001$ ). The “Sawing in half” illusion differs from “Escaping a straitjacket” (Scheffé’s test=3.75;  $p=.001$ ) and from “Harrow” illusion (Scheffé’s test=6.3;  $p<.001$ ), which differ significantly, too (Scheffé’s test=2.56;  $p=.04$ ; respectively  $M=7.18$ ,  $SD=3.43$ ;  $M=4.74$ ,  $SD=3.29$ ;  $M=3.06$ ,  $SD=3.04$ ; see Figure 2).

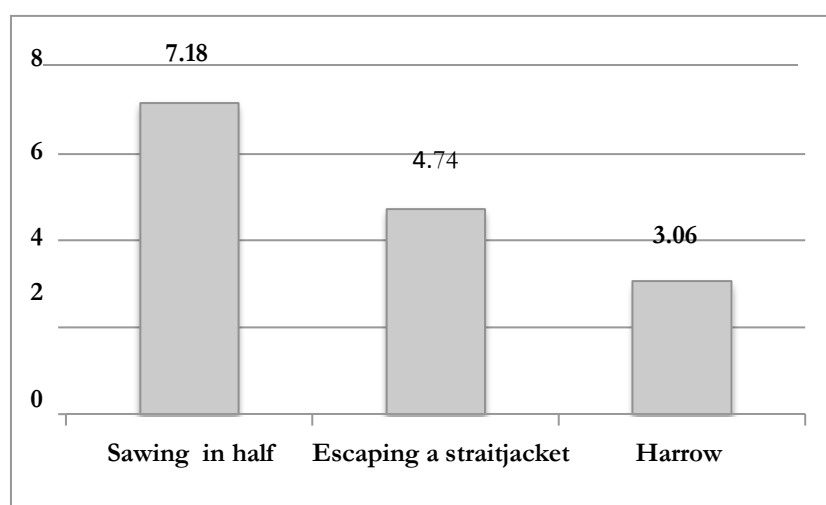


Figure 2: Familiarity of the 3 illusions evoked

Moreover, the familiarity of the illusion does not correlate with the index of attractiveness ( $r=.03$ ,  $p=.70$ ), but does correlate with the index of danger ( $r=-.27$ ,  $p=.0007$ ; 7 participants who did not answer the question of familiarity were excluded for the calculation). So, the more familiar the illusion, the less it is perceived as dangerous. But its attractiveness is not linked to its familiarity. That could explain the fact that, in our experience as part time professional magician, the so frequently presented “Sawing in half” illusion seems to always attract the spectators the same manner.

### Discussion

We conducted this study, firstly to strengthen the content of our conference, secondly to open a topic that seems little developed in studies on theatrical magic. Specifically, the aim of the present study was to collect emotions associated with some stage illusions, and to describe the potential link



between emotions and the attractiveness of the illusions, their perceived danger and their perceived risk of death.

About the emotions evoked in the free association task, results show that the fear is the most cited emotion, even when thinking about “Sawing in half illusion”. That is rather intriguing, because the frame of the present study is stage magic, entertainment. As no picture was proposed, we interpret this answer in terms of representation of the illusion: for lay people, the “Sawing in half” illusion has probably a different signification than for magicians. But we have seen that this illusion is perceived to generate less stress than the two others.

We find interesting to note that the different illusions mainly evoke negative emotions. That is, too, rather surprising, because magic is conceived as a joyful entertainment. But according to Leddington, “*the experience of magic can be aesthetically pleasurable, not despite, rather thanks to, some of the strong negative emotions it provokes*” (2017, p.34). The valence of the emotions evoked in the present study may be due to the fact that illusions were not shown, but only described. Otherwise and probably more important theoretically speaking, we have to notice that participants evoked much more primary emotions than secondary ones (Damasio, 1995, p.131 sq.; Demoulin et al., 2004; and about basic emotions see Ekman, 1992). This result can also be linked to the previously mentioned children’s reactions in front of events that violate physical rules: they react mainly in terms of primary emotions. In that sense, it may be coherent to link magic with childhood (at least, as French people frequently do when I meet them as a part-time professional magician). But another question emerges. Some people (in my personal experience, mainly women<sup>11</sup>) don’t like magic. Is it because magic not only confront them to their limits and may question their self-esteem, but also generates primary emotions, perceived as too “unrefined”, too “childish”, or less “human”? In other words, do magic question people about their conception of self-humanity?

About the evaluations of the different illusions, the three are perceived as equally attractive. Overall, results show that the “Sawing in half” illusion is different from “Escaping a straitjacket” illusion and “Harrow” illusion. Indeed, the “Sawing in half” illusion is perceived as less dangerous than the two others, which are perceived as equally dangerous. It is also perceived as more rigged than the two others. It is, too, the more familiar for participants. That is not intriguing, because that illusion is known to appear as early as 1920’s<sup>12</sup>, and is frequently presented in magic shows.

Otherwise, results show that the more an illusion is familiar to participants, the less it is perceived as dangerous. Most probably that is due to the fact that people have never seen really dangerous consequences of the performance of an illusion, which are not broadcast. But results show that the attractiveness of an illusion is not linked to its familiarity. That could explain the fact that, in our experience as magician, the so frequently presented “Sawing in half” illusion (or its following variants, as Robert Harbin’s “*ZigZag Girl*” or Jim Steinmeyer’s “*Modern Art*”) seems to always attract the spectators. Finally, results show that the more participants think that “there is a rigging”, the less they perceive the illusion as dangerous. But the more the illusion is perceived as dangerous, the more it is perceived as attractive.

Some remarks have to be made, in order to design future studies. Firstly, in the present study, the emotions are evoked by the representation of the illusion, not by the illusion itself. Of course, we ignore the content of this representation. So, in the future it is absolutely necessary to conduct a study in which, firstly participants watch different illusions, then are questioned about the emotions they have felt<sup>13</sup>. That implies firstly to conduct a rigorous pre-test to select the illusions. Secondly that implies to choose between a free association task and a standardized emotion test. But that depends on the hypotheses. A second remark is the latter: in the present study, what did people call “emotions”? Did they consider happiness, joy, sense of wonder etc. as emotions? In France, the daily observation leads to conclude that the word “emotions” refers mainly even only, to “negative” emotions (fear, anger, sadness...). In the present study, it seems that it has been the case. A third

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<sup>11</sup>This repeated observation in a context of magical performances has to be systematically tested, of course!

<sup>12</sup>This illusion was first performed by P.T. Selbit, who is known to be the first magician to choose as his “victim”, (see for example Johnstone, 2007; and Wikipedia).

<sup>13</sup>Another method is to observe the emotions expressed

question is linked to the familiarity of the illusion. Some are well known since a very long time (“Sawing in half” illusion) or at least since many years (“Escaping a straitjacket”, as performed by Houdini), some are less known (“Harrow” illusion). In the free association task of the present study, some participants answered that they have been bored, or that they felt no emotion when they thought to the “Sawing in half” illusion, because they have seen it very frequently. Others said that they feel very few stress, because they frequently saw this illusion. Indeed, one can link emotional reaction (here, when watching an illusion) and habituation or desensitization, which have been shown for example in studies on the effects of violence (Drabman & Thomas, 1974; Hanratty Thomas et al., 1977; for a French review see for example Niedenthal et al., 2006). More, desensitization has been observed on physiological and behavioural indexes : the more people watch violence, the less their body express emotional reactions (Courbet & Fourquet-Courbet, 2007).

So in next studies, it would be necessary to control the participants’ degree of familiarity with the illusions presented in order to test the link between the familiarity of the illusion and different preselected emotions. A fourth question emerges from Leddington’s (2016) seminal reflexion, echoing Ortiz’s (1994) and Tamariz’s (2000) ones. So, the magician Darwin Ortiz (1994) thinks that there is a difference between intellectual beliefs and emotional beliefs: intellectual beliefs imply cognition (you know that it is impossible), emotional beliefs imply emotion (you feel the impossible). Leddington’s point of view is that the magic dawns when there is a tension between beliefs and reality. In 2017 he wrote: “*something that we know cannot happen seems actually to happen (contra the fiction schema) here and now (contra the representation schema)*” (p.35; see too Kuhn, 2019: 14-15). So, one of the many questions that arise is: which emotion comes in tension/conflict with which belief to create magic in the mind of the spectators? Many other questions, more or less related to emotions, could be asked: for example the effects of presentation, music and light, or the effects of the explicit or implicit psychological contract between the magician and the audience (see Landman, 2013). These factors and many more others may indeed affect audiences’ emotions. That could be the case of cultural factors (Matsumoto, 1989, 1990; Zhu, Ho, & Bonanno, 2013) or immediate social context (see for example Diamond & Aspinwall, 2003, and more generally Tiedens & Leach, 2004). For example we could investigate the impact of the other’s emotions on the individual’s ones in the context of show magic, or study the impact of different factors (degree of identification with the audience as a group, perceived proximity with the artist, and so one...) on emotions. Magicians could also be questioned about the emotions they want to create in their audiences. To conclude, we hope that the present study has begun to “open the door”. Many research tracks remain to be investigated. That is very encouraging for the future research on what we call a “social psychology of magic”.

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### **Authors respective contribution:**

Pascal Morchain initiated the study, collected and analyzed the data, and wrote most of the article. Clémentine Tranchet added some paragraphs about emotions and suggested future directions for research.

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