Psychology of Aesthetics, Creativity, and the Arts

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Online First Publication, April 24, 2025. https://dx.doi.org/10.1037/aca0000762

CITATION

Wincza, R., & Kuhn, G. (2025). Challenging magicians' intuitive insights: The role of audience participation in experiencing a magic trick. *Psychology of Aesthetics, Creativity, and the Arts*. Advance online publication. https://dx.doi.org/10.1037/aca0000762

AMERICAN PSYCHOLOGICAL ASSOCIATION
DIVISION 10
Psychology of Aesthetics, Creativity, and the Arts

ISSN: 1931-3896
https://doi.org/10.1037/aca0000762

Challenging Magicians' Intuitive Insights: The Role of Audience Participation in Experiencing a Magic Trick

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Magic is a performance art that relies on tricking the spectator's mind into experiencing things that seem impossible. Experience in performing these tricks in front of live audiences provides magicians valuable insights into how spectators experience such tricks. However, most of these assumptions have not been empirically tested. Three widely held assumptions were selected: active participation increases the sense of wonder that participants experience, naming a card feels freer to the participant than physically selecting a card from a deck, and a trick that happens in the spectator's hand is more impressive than if it happens elsewhere. To validate those assumptions, we asked 201 magicians about their insights on performing magic. Data from our experimental studies did not support magicians' assumptions about how magic is experienced. Magic that happened in the participant's hand was not viewed as more impossible or engaging than when it happened elsewhere. Also, active participation did not increase enjoyment but increased confusion. Interestingly, contrary to magicians' insights, we observed that participants felt that selecting a card was felt as being freer than naming a card. We discuss these findings in light of the sense of agency participants experienced over their own thoughts and behaviors. These findings provide interesting insight into how the art of magic is experienced and pave new avenues into the study of the sense of agency over one's thoughts and behaviors.

Keywords: experiences of magic, psychology of magic, active engagement, sense of agency

Supplemental materials: https://doi.org/10.1037/aca0000762.supp

Magic is a performance art that relies on tricking the spectator's mind into experiencing things that seem impossible. There has been much scientific interest in examining the psychological mechanisms that underpin the creation of these illusions (Kuhn et al., 2008; Macknik et al., 2008; Rensink & Kuhn, 2015a, 2015b; Thomas et al., 2015). For example, numerous studies have investigated how magicians misdirect people's perceptual and attentional processes (Ekroll et al., 2017; Ekroll & Wagemans, 2016; Kuhn et al., 2014) or the way they exploit cognitive biases to influence the decisions a person makes (Pailhès et al., 2020). However, far less is known about the experience that such illusions elicit and the factors that influence the strength of the illusions (Grassi et al., 2024; Leddington, 2016). Insights into the psychological mechanisms that underpin our enjoyment of magic have important implications for understanding our appreciation of this unique, yet often neglected art form. Moreover, such insights may also illuminate the nature of people's beliefs and human cognition (Griffiths, 2015; Lewry et al., 2021; Rensink & Kuhn, 2015a). In this article, we examined how a spectator's involvement in a trick influenced how they experienced the magic trick and examined whether magicians truly understand the impact that their tricks have on how people enjoy them.

A magic trick can elicit a wide range of emotions, but at the core of this experience lies a cognitive conflict between the event that we experience and our prior knowledge about the world. We find ourselves experiencing something that we know cannot happen and yet we see it happen in front of our eyes. There have been several theoretical frameworks that attempt to explain how or why we enjoy magic (Grassi & Bartels, 2021; Grassi et al., 2024; Kuhn, 2019; Lamont, 2017; Leddington, 2016, 2017), but there is little empirical research on the topic.

Medeiros et al. (2022) conducted a qualitative analysis examining what people enjoy about magic. Participants reported that they enjoyed the entertainment and the feelings that magic evokes (mystery, wonder, surprise, and amazement), aspects of the magician themselves (e.g., their skills), as well as beliefs in the impossible, and the child-like feelings that magic evokes. Neuroimaging studies support the view that cognitive conflict lies at the heart of magic (Danek et al., 2015; Parris et al., 2009), and it has been suggested that this cognitive conflict may account for why we are captivated by magic (Kuhn, 2019). For example, infants are drawn toward causal violations, and Harris (1994) suggested that this explains our interest and captivation by magic tricks during adulthood. Indeed, Lewry et al. (2021) demonstrated that infants' developmental trajectory of physical knowledge relates to adults' interest in different types of magical effects.

Evangelia G. Chrysikou served as action editor.
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Several theoretical accounts of magic predict that our experience of magic will be directly related to the extent to which the experience conflicts with what we believe to be possible (Grassi & Bartels, 2021; Kuhn, 2019). In support of this idea, Bagienski and Kuhn (2023) have shown that people's enjoyment of a magic trick was directly related to the extent to which they believed the event to be possible. Kuhn et al. (2024) corroborated these findings showing a positive correlation between impossibility and a range of epistemic emotions, including enjoyment.

Another feature that is central to magic is that it often relies on directly involving members of the audience. Magic is a highly interactive art form, and magic tricks often rely on social interactions between the magician and their audience. For example, in close-up magic, members of the audience are often encouraged to physically inspect props or asked to make decisions (e.g., picking a playing card) that influence the course of the performance. Such social interactions form a central part of many magic tricks, and they are thought to play an important role in how people experience the performance. For example, asking a spectator to pick a playing card actively engages them in the performance, and it is likely that this engagement also heightens the emotions that such a performance elicits. To date, very little is known about the impact that such social interactions have on how people experience a magic performance. Our first objective was to examine whether active participation in the magic performance changed the way people experienced the performance. Put simply, are people more engaged and impressed by a magic performance if they actively engage in the performance? We call this the engagement hypothesis, and we predicted that people should feel stronger emotions if they are directly involved in the performance than when they are observing the performance passively.

There are lots of ways in which magicians can orchestrate an active engagement with their audience. One common principle involves asking members of the audience to make decisions that will influence the outcome of the trick. For example, most card tricks involve members of the audience selecting a playing card (Pailhès et al., 2020), and this selection process plays an important role in engaging the audience in the trick (Kumari et al., 2018). Now the trick is no longer simply about a random deck of playing cards but instead becomes centered around a personal selection. In most card tricks, a single person is asked to pick a card. The engagement hypothesis predicts that the individual who actively picks the card will become more engaged in the performance than their fellow spectators, who are passively observing the trick unfold.

Magicians have acquired much experience in performing magic tricks in front of live audiences, and monitoring their reactions has provided them valuable insights into the nature of their tricks (Kuhn, Pailhes, & Cole, 2025; Kuhn, Rustrick, et al., 2025). One of the central premises of the science of magic rests on the idea that this real-world knowledge can illuminate the nature of human cognition (Kuhn et al., 2008; Macknik et al., 2008; Rensink & Kuhn, 2015a; Thomas et al., 2015). However, more recently, we have urged caution in taking this anecdotal evidence at face value and question whether magicians truly understand the psychological mechanisms that underpin their illusions (Kuhn, Pailhes, & Cole, 2025; Kuhn, Rustrick, et al., 2025; Pailhes & Kuhn, 2023). In this article, we aimed to test two prominent views on magic that related to how people choose a card, and the physical location where the magic happens. We chose these two principles because of their prominence within the magic community and because they can be empirically tested. Let us now explain why these two principles have important implications for how magicians design their magic tricks and why they are thought to influence the strength of a trick.

Magic relies on multiple levels of deception (Smith, 2015), and the true art of magic relies on combining lots of different subtleties that enhance the way the audience experiences the trick. This intricate trick architecture has a major impact on how people experience the trick, and this is often what distinguishes a master magician from a novice (Ortiz, 1994, 2006). Let us use a simple card trick to examine some of these subtleties. In a typical "pick a card" trick, the spectator selects a playing card, which is then returned and lost in the pack of playing cards. The magician then either performs an elaborate ritual to reveal the chosen card or demonstrates that they managed to predict the freely chosen card (Giobbi, 1994). There are thousands of ways in which this basic trick can be performed (Hugard, 2006), and magicians hold strong views about the impact that different variations of this trick will have on how people experience the trick (Lamont & Wiseman, 1999).

There are lots of ways in which the spectator can select the playing card, and the nature of this selection process is thought to affect the way members of the audience will experience the trick (Pailhès et al., 2020). For example, Pailhes and Kuhn (2023) asked magicians to predict how free someone feels after selecting a playing card using several different card selection methods (e.g., naming a card, cutting to a card and picking a card from cards spread on the table.). Magicians felt that asking someone to name a random card resulted in the freest selection. This is likely because it is much harder for magicians to influence the selection process if people are asked to name a card than when they are asked to physically select it. Indeed, magic tricks that involve the spectator to simply name a card have a special status in the world of magic (Segal, 2021), and they are generally thought to be more impressive.

As argued elsewhere, magicians' insight into the nature of these effects may not necessarily be reliable (Pailhes & Kuhn, 2023). For example, questionnaire-based data (Pailhes & Kuhn, 2023) suggest a spectator can experience a physical selection to feel freer and less immune to suggestion compared to when the card is verbally named. In Experiment 1, we put this idea to the test, by manipulating whether a spectator physically selected a playing card or whether they simply named it. In line with magicians' insights', we predicted that participants should rate a selection made verbally as freer and more immune to external influence than when they are asked to select the card manually. Moreover, we predicted that participants should be more amazed by a magic trick in which they are asked to verbally select a card than when they are asked to physically pick it up from the deck.

Magicians hold strong views about what constitute a good trick and also about the performative factors that result in strong magic (Ortiz, 1994). However, it is much harder to isolate the psychological factors that constitute a strong trick or the emotions that such a trick will elicit. Magic can elicit a wide range of emotions - as we watch a magic trick, we experience an amazing event that we believe to be impossible (Bagienski & Kuhn, 2023; Lamont, 2017) which will elicit surprise (Grassi & Bartels, 2021; Grassi et al., 2024; Ozono et al., 2021) and wonder (Kuhn et al., 2008; Lamont, 2017). The trick may also elicit confusion (or bafflement) as we fail to resolve the mental conflict between the event that we have experienced and our beliefs about the world (Grassi et al., 2024). This confusion may elicit anxiety in some individuals (Leddington, 2017), and we predict that active

involvement in the trick will have a larger impact on this emotion. The primary objective of a magic trick is to entertain, and thus, we expect that participants should enjoy the performance, be engaged, and be amused. We predict that active participation in the trick will enhance the level of engagement felt by the participant. We had no clear prediction about how our manipulation would affect these final emotions.

Experiment 1

In the first experiment, we examined whether people would feel more engaged in a magic trick and experience different emotions if they were directly involved in the trick. A magician performed a short card trick in which a member of the audience was asked to either physically select a card from a deck of playing cards and reveal the identity or verbally name a card. After making this genuinely free selection, the magician spread a different deck of playing cards in his hands to reveal that there was only one face-down card inside the deck, which turned out to be the freely chosen card. This is a well-known magic trick called "Invisible Deck," and it allows us to magically reveal the identity of any card. Participants watched the performance in small groups, and we predicted that the persons making the selection would report a stronger sense of engagement and stronger emotions than the participants who passively observed the performance.

Within the magic literature, there is a strong belief that people should feel a selection to be freer when the member of the audience is asked to name the card rather than physically selecting it, and a previous survey supports this view among magicians (Pailhes & Kuhn, 2023). Our second aim was to test this assumption by either asking the spectator to physically select a playing card or to verbally name it. If magicians' insights into the nature of this principle are correct, we would expect participants to report a stronger sense of freedom in their selection when the card is named, which would result in higher ratings of the magic trick.

Method

Participants

In total, 134 participants ($M_{age} = 23.25$, $SD = 6.16$, range = 18–49) took part in the study. There were 79 females, 53 males, and two participants described themselves as nonbinary. Participants were mainly students at Goldsmiths, University of London, United Kingdom.

Materials

The magic trick: The "Invisible Deck" is a magic trick in which the spectator can name a playing card, after which the magician spreads through a face-up deck of playing cards to reveal one face-down card, which turns out to be the freely named card. We adapted this trick to manipulate how the card was chosen. In the verbal selection condition, one of the participants was asked to verbally name the card, after which the magician magically produced the card from the deck of playing cards. In the physical selection condition, participants were handed another deck of cards, demonstrating that the cards were all distinct and thoroughly shuffled, and they were subsequently instructed to shuffle the deck once more and physically select any card from the face-down spread laid out by the magician. Once the card was selected, the magician used another deck of playing cards to magically reveal the same card. Both tricks were identical, except for how the cards were selected.

We respect the magicians' code of not revealing the secret to this effect. Researchers interested in replicating the findings are encouraged to contact the authors or look up the Invisible Deck trick in a magic shop. We report all measures and data exclusion procedures, and we confirm that we received clearance from the Goldsmiths, University of London ethics committee before commencing data collection.

Procedure

The data collection took place at various locations within the Goldsmiths, University of London. The researcher approached small groups of students and invited them to participate in the research. Once the group had expressed their willingness to take part, they were provided with consent forms to sign. Participants were then randomly assigned to one of the two conditions before the experiment commenced. There were a total of 42 groups. There were 11 groups of two participants, 18 groups of three participants, six groups of four participants, and seven groups of five participants. These small groups were randomly allocated to the physical or verbal card selection condition. Participants within these groups were then randomly allocated to passively watch the trick or to actively participate by selecting the card.

The experimenter performed the "Invisible Deck" trick (Experiment 1) and the "Card Sandwich" (Experiment 2) trick for each group. As the participants witnessed both tricks, the order of tricks and conditions was randomized between participants. The two magic tricks measured different magic assumptions, which are why they are described as separate experiments. Also, we did not observe any significant order effects.

After witnessing the "Invisible Deck" trick, each participant was asked to rate how free they felt about the selection of the card, where 0 indicated *not free at all* and 100 indicated *extremely free*. This was followed by a question that asked them to indicate how likely they thought it was that the magician influenced their choice, where 0 indicated *not at all* and 100 *extremely likely*. Participants were then asked to use a 10-point scale (1 = *not at all*, 5 = *neutral*, 10 = *extremely*) to rate the extent to which they experienced the following emotions to describe how they felt about the magic trick: amazed, enjoyment, surprised, wonder, engaged, anxious, confused, amused, interested, and excited.

Design

The study used a 2 × 2 between-subjects design with the agent selecting the card (self vs. other) and card selection method (verbal vs. physical) as a between-participants factor. Given the exploratory nature of the study and the numerous emotions we set to investigate, we decided not to apply corrections for multiple comparisons. This decision is supported by Althouse (2016) who advocates not adjusting for multiple comparisons in exploratory studies as long as this decision is clearly communicated to the readers. Furthermore, Bayes factors (BF) were calculated using JASP (JASP Team), with values greater than 3 providing substantial evidence for the alternative hypothesis and values below 0.33 indicating substantial evidence for the null hypothesis (Jarosz & Wiley, 2014). The default priors in JAPS were used for the Bayesian analyses, and the comparisons were made against the null model. This was done for both

Experiments 1 and 2. The same statistical approach was implemented for both Experiments 1 and 2.

Results and Discussion

Our first analysis examined the freedom ratings. Figure 1 shows the mean influence (right) and freedom (left) ratings for each of the conditions. Levene's tests as well as Shapiro-Wilk's tests were violated across all conditions (both freedom and influence ratings: all $ps < .001$). The F tests conducted here are largely unaffected by nonnormal distributions (Blanca Mena et al., 2017; Khan & Rayner, 2003). It is important to mention that the Shapiro-Wilk test is known to produce unreliable results in larger samples ($n > 50$; Kim, 2013; Razali & Wah, 2011; Royston, 1982). As the sample size increases, smaller standard errors can lead to z tests rejecting the normality assumption, even in cases where the distribution does not significantly deviate from normality (Kim, 2013). A two-way analysis of variance (ANOVA) with agent (self vs. other) and card selection method (verbal vs. physical) found a main effect of card selection method, $F(1, 130) = 10.5$, $p = .002$, $\eta_p^2 = .08$, but no significant main effect of agent, $F(1, 130) = 1.14$, $p = .287$, $\eta_p^2 < .01$, or an agent by card selection method interaction, $F(1, 130) = 0.17$, $p = .681$, $\eta_p^2 < .01$. These results were confirmed by a Bayesian set of identical statistical analyses. Here, we observed the main effect of the card selection method, $BF_{10} = 21.90$, but not the main effect of the agent, $BF_{10} = 0.28$, as well as interaction, $BF_{10} = 7.11$.

Our next analysis examined the influence ratings (Figure 1). A two-way ANOVA with agent (self vs. other) and card selection method (verbal vs. physical) found a main effect of card selection method, $F(1, 130) = 4.90$, $p = .029$, $\eta_p^2 = .04$, but no significant main effect of agent, $F(1, 130) = 3.93$, $p = .050$, $\eta_p^2 = .03$, or an agent by card selection method interaction, $F(1, 130) = 0.01$, $p = .902$, $\eta_p^2 < .01$. Again, the Bayesian analyses confirmed our earlier results, as no main effect of the card selection method was observed, $BF_{10} = 2.07$, nor the agent, $BF_{10} = 0.89$, nor any interaction, $BF_{10} = 2.36$. Contrary to magicians' insight, a verbal selection resulted in a lower sense of freedom and a higher level of influence than a physical selection, thus supporting our hypothesis and earlier findings by Pailhes and Kuhn (2023). However, these ratings were independent of the agent making the selection.

Rather surprisingly, there was no significant correlation between the participants' sense of freedom ratings and the extent to which they felt the card selection could be influenced (see the online supplemental materials). Only the sense of freedom moderately correlated significantly with engagement ($r = .336$, $p < .001$), while other emotions yielded weak, largely nonsignificant correlations. The sense of influence did not correlate significantly with any of the other ratings. These results illustrate that participants were significantly more engaged when they felt they had more freedom over the card selection, but that this did not significantly relate to the other emotions that the trick elicited. Furthermore, we used 10 emotion ratings that are central to the experience of magic to examine the emotional response that the trick would elicit. It is clear from the table that all emotion ratings are significantly correlated (all $rs > .23$), apart from anxiety. Anxiety was moderately, significantly correlated with confusion. However, interestingly, the level of confusion was also significantly correlated with enjoyment and several of the other positive emotions. Please see the online supplemental materials for an in-depth overview of these correlations.

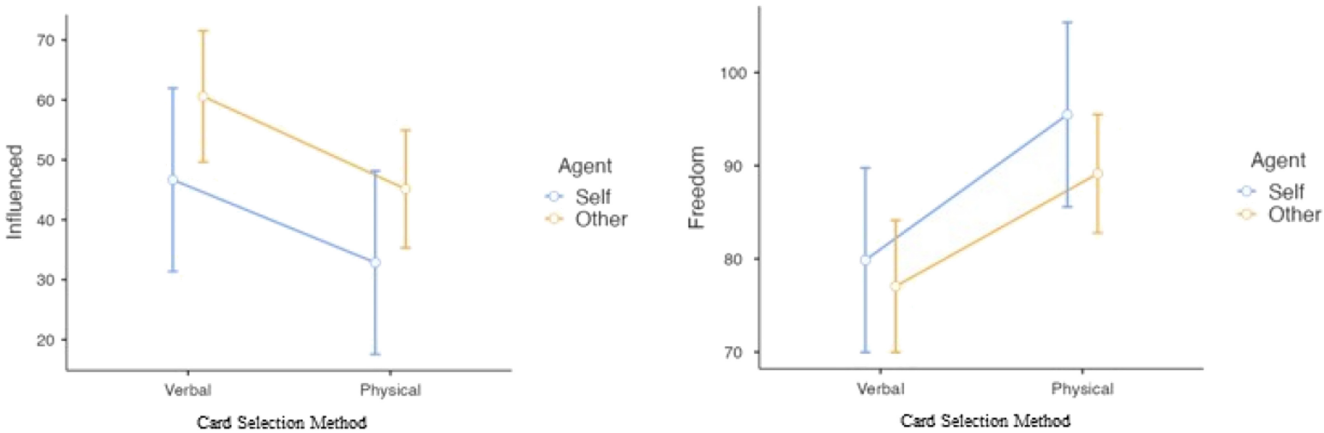
Figure 2 shows participants' mean emotion ratings depending on whether they were directly involved in selecting the card or the card was selected by another person, while Figure 3 shows mean emotion ratings depending on whether the card was selected verbally or picked up from the deck.

As is clear from the graph, there was very little difference depending on whether participants themselves selected the card or whether it was selected by others. Table 1 shows the t tests and BF for the differences between whether the selection was made verbally or physically or whether the selection was made by the self (active participant selecting the card) and the other person (passive participant watching the other person selecting the card). None of the differences were significant besides the level of anxiety that the trick elicited. However, participants felt significantly more anxious when they selected the card themselves than when it was selected by another person.

In terms of card selection (whether verbal or physical), there were no significant differences besides impossibility, which was rated significantly higher when the card was physically selected

Figure 1

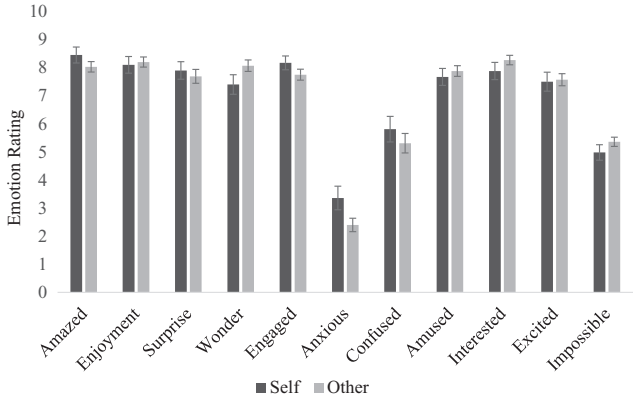
Ratings of Magicians' Influence and Freedom of Selection



Note. Mean influence (left panel) and freedom ratings (right panel) as a function of how participants selected the card and whether the card was selected by themselves or another person in the group. Error bars denote the standard error of the means. See the online article for the color version of this figure.

Figure 2

Emotions Elicited by the Magic Trick as a Function of Agency

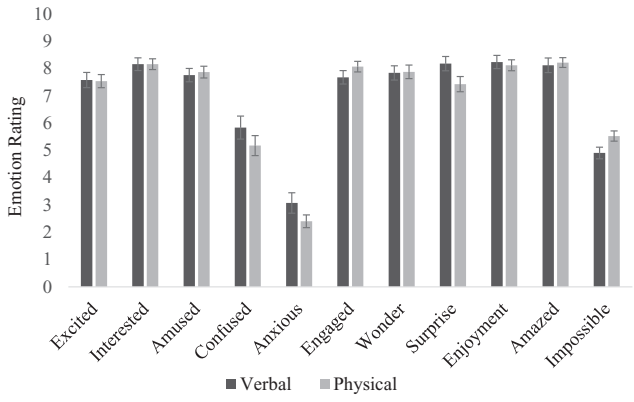


Note. The mean emotion ratings as a function of whether the card was selected by themselves or another person in the group. Error bars denote standard errors of the mean.

(yet, the Bayesian statistics suggest that there is not enough evidence to reject the null hypothesis—see Table 1). Rather surprisingly, these ratings were independent of whether participants were directly involved in the selection process (picked the card or merely watched the card being picked) or whether this was made by a different agent. In fact, the Bayesian statistics (following Jarosz & Wiley's, 2014, rule of BF under 0.33 suggesting evidence for the null hypothesis) indicate strongly that most of these emotions do not differ whether the card is named or picked or whether it is done by the person or the spectator, while mostly the different feelings produced BFs of under 1, providing weak evidence for the null hypothesis. However, we observed a strong effect ($p < .001$, $BF_{10} = 21.90$) showing that naming a card ($M = 78.0$, $SD = 28.2$) results in experiencing less freedom than physically selecting a card from the deck ($M = 90.9$, $SD = 17.2$). In line with these results, participants who named a card ($M = 55.87$, $SD = 35.35$) reported feeling more influenced than the ones who picked a card ($M = 41.6$, $SD = 36.1$).

Figure 3

Emotions Elicited by the Magic Trick as a Function of Whether the Card Was Selected Verbally or Physically



Note. The mean emotion ratings as a function of whether the card was verbally or physically selected. Error bars denote standard errors of the mean.

Table 1

p Values and Bayes Factor Between Conditions

	Verbal versus physical				Self versus other			
Emotions	Bayes factor$_{10}$	*t*	*df*	*p*	Bayes factor$_{10}$	*t*	*df*	*p*
Amazed	0.19	−0.30	130	.762	0.40	1.25	132	.214
Enjoyment	0.20	0.39	130	.695	0.21	−0.32	130	.753
Surprise	1.02	1.94	130	.055	0.22	0.52	130	.608
Wonder	0.19	−0.11	128	.916	0.78	−1.75	128	.083
Engaged	0.38	−1.24	127	.217	0.42	1.28	127	.204
Anxious	0.56	1.56	130	.122	1.46	2.12	130	.036
Confused	0.36	1.2	130	.232	0.27	0.84	130	.404
Amused	0.20	−0.32	129	.751	0.24	−0.61	129	.545
Interested	0.19	−0.02	131	.986	0.39	−1.22	131	.224
Excited	0.19	0.13	131	.900	0.20	−0.18	131	.855
Impossible	1.70	−2.21	128	.029	0.41	−1.26	128	.211
Freedom	21.90	−3.28	132	.001	0.28	−0.89	132	.377
Influenced	2.07	2.32	132	.022	0.89	1.83	132	.069

Our experimental manipulations had a relatively limited impact on the emotions that the tricks elicited. Participants reported a higher level of impossibility for the physical selection and higher levels of anxiety when they were directly involved in the selection. However, it is important to note that these effects were relatively weak. Contrary to our prediction, participants did not feel significantly more engaged in the performance when they were making the selection themselves. These results suggest that passively observing the performance is sufficient to engage the audience. In fact, our engagement scores were extremely high, suggesting that the performance itself was engaging.

Experiment 2

In the second experiment, we investigated a key principle that magicians often use to engage their audience—the physical proximity in which the magic happens. The exact nature of the audience involvement plays an important role in how magicians design their tricks. For example, it is often assumed that magic performances in live settings are more impressive (Jay, 2016; Kuhn, Pailhes, & Cole, 2025; Kuhn, Rustrick, et al., 2025) because they allow for a closer audience interaction. Likewise, magicians often comment on how close-up magic is more impressive than when tricks are performed on a large stage since the latter allows for less close examination (Kuhn, Pailhes, & Cole, 2025; Kuhn, Rustrick, et al., 2025). One aspect of social interaction that seems to play a particularly important role is where the magic effect itself takes place. The physical proximity between the audience and the performer has an important impact on the type of deceptive methods that can be employed. Magic tricks are often marketed as being particularly impressive if the effect takes place in the spectator's hand. For example, sponge balls can appear and multiply in the spectator's hands or a ring can disappear from the spectator's hand. We call this the "magic in the spectator's hand" hypothesis. It is likely that the physical proximity between the spectator and the magic affects how people experience the effect.

Personal conversations with magicians reveal strong support for the "magic in the spectator's hand" hypothesis, though any theoretical explanations as to why this should be the case are sparse. Since there is very little magic literature on this principle, we aimed to establish how common this belief was among practicing magicians.

To do so, we ran a survey asking magicians to rate how the physical proximity between the audience and the magic effect affected how the spectator would experience the magic (Experiment 2a).

In Experiment 2b, we directly tested the "magic in the spectator's hand" hypothesis by performing a card trick in which the spectator held a playing card that magically changed into a different card. We predicted that the effect would be stronger and therefore elicit stronger emotions if the spectator was holding the card (i.e., magic happens in the spectator's hand) compared to when the card was placed on the table in front of them.

Experiment 2a

Method

Participants. In total, 201 magicians participated in the survey, but data from five participants were excluded because of incomplete data. All magicians reported a minimum of 2 years of experience in magic with a mean of 26 years ($SD = 18.2$, range = 2–78). The mean age was 46.7 years ($SD = 15.9$, range = 11–84). One hundred and eighty-four participants were male, eight female, and two nonbinary, and seven chose not to disclose their gender.

Materials and Procedure. We asked magicians to rate how impressed people would be depending on the context in which the trick was being performed. Participants were asked to use a 5-point scale (-2 = *strongly disagree*, 1 = *somewhat disagree*, 0 = *neither agree or disagree*, 1 = *somewhat agree*, 2 = *strongly agree*) to indicate their views on the following three statements.

- Magic tricks that are performed live are more impressive than when they are performed on video.
- Magic tricks performed close-up are more impressive than when they are performed on stage.
- Magic tricks that take place in the spectator's hand are more impressive than when they take place elsewhere.

Results and Discussion

Our first analysis focused on the responses provided by the magicians concerting the strength of the effects in different contexts. These scores ranged from -2 (*strongly disagree*) to $+2$ (*strongly agree*). The average rating for whether live performances were more impressive was 1.65 ($SD = 0.78$, 95% confidence interval [CI] = [1.54, 1.76]), implying that most magicians agreed to strongly agreed that a live performance is more impressive. They also agreed that close-up magic was more impressive than stage magic ($M = 0.92$, $SD = 1.01$, 95% CI = [0.78, 1.06]) and crucially strongly agreed that magic happening in the spectator's hand is more impressive ($M = 1.45$, $SD = 0.79$, 95% CI = [1.34, 1.56]).

Experiment 2b

Method

Participants. Participants who took part in Experiments 1 and 2a also participated in Experiment 2b. The order of the experiments was counterbalanced, and no significant order effects were observed.

Materials and Procedure. We performed a card trick typically known as a "Card Sandwich" effect, which involves two playing cards mysteriously swapping places. One of the spectators (active agent) was invited to pick a card from a deck of playing cards that was spread in front of them. After memorizing the card and showing it to all the other spectators, the card was reunited with the remaining cards, and the magician shuffled the cards. The magician then executed a magical gesture after which he revealed that the chosen card had risen to the top of the deck. The magician then placed this card face down on the spectator's palm and the magician instructs them to cover it with their other hand securely. The magician then removed another card from the top of the deck, revealed it to the participant, and used it to gently touch the top and bottom of the spectator's hand (face down). The magician proceeded to claim that the cards had now changed places—he turned over his card to reveal that it had turned into the spectator's chosen card. The spectator is now invited to check the identity of their own card, which has magically transformed into the magician's card. This is a typical card trick in which the magic takes place in the spectator's hand.

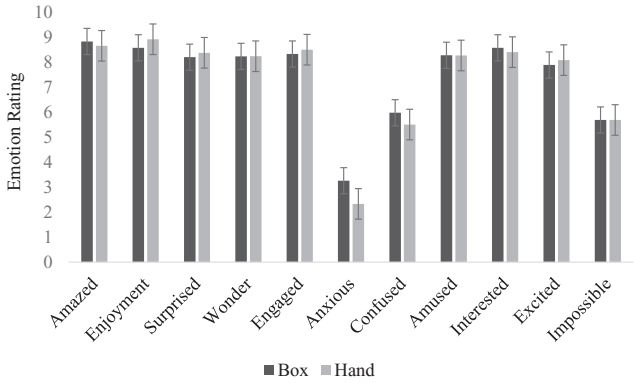
We created an identical version of this trick where the magical transformation took place in a different physical location. Instead of inviting the spectator to hold the card between their hands, the card was placed face down under a card box, while ensuring that part of the card was visible throughout the trick. The card box was previously inspected by the participant who selected the card. After witnessing the "sandwich trick" trick, each participant was then asked to use a 10-point scale (1 = *not at all*, 5 = *neutral*, 10 = *extremely*) to rate how impossible they felt the trick had been followed by the extent to which they experienced the following emotions to describe how they felt about the magic trick: amazed, enjoyment, surprised, wonder, engaged, anxious, confused, amused, interested, and excited.

Results and Discussion

Our first analysis examined the impossibility (Levene's $p = .591$, indicating equality of variances, while Shapiro-Wilk tests all ps $< .001$—however, in line with arguments from Experiment 1, normality was assumed) ratings (Figures 4 and 5). A two-way ANOVA

Figure 4

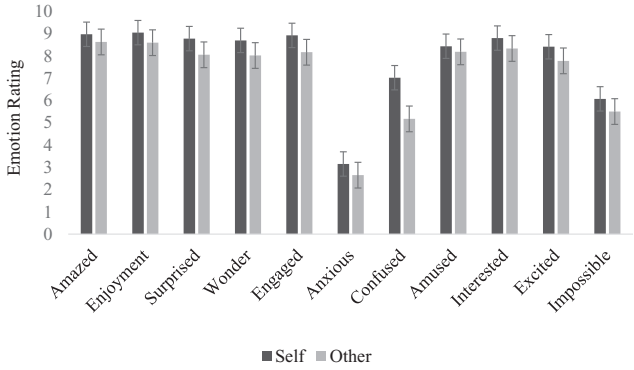
Emotions Elicited by the Magic Trick as a Function of Effect Location



Note. The mean emotion ratings as a function of whether the card switched in the hands or underneath a card box. Error bars denote standard errors of the mean.

Figure 5

Emotions Elicited by the Magic Trick as a Function of Agency



Note. The mean emotion ratings as a function of whether the card was selected by the active or passive participant. Error bars denote standard errors of the mean.

with agent (self vs. other) and trick location (hand vs. box) found no main effect of card selection method, $F(1, 125) = 3.24$, $p = .074$, $\eta_p^2 = .03$, no significant main effect of trick location, $F(1, 125) = 0.17$, $p = .680$, $\eta_p^2 < .01$, or an agent by card selection method interaction $F(1, 125) = 1.10$, $p = .317$, $\eta_p^2 < .01$. Akin to Experiment 1, we reran these analyses with their identical Bayesian analyses, which also showed no main effect of the trick location, $BF_{10} = 0.37$, the agent, $BF_{10} = 0.81$, nor any interaction, $BF_{10} = 0.15$. Contrary to magicians' insight, the trick was not significantly more impossible when it happened in the spectators' hands compared to when it took place elsewhere.

Our next analysis focused on participants' responses toward the magic trick both with regard to the agency (i.e., the person directly involved in the trick or not) and whether the trick happened in the spectator's hand or under the box. Figure 4 shows the participants' mean rating as a function of the physical location of the effect. Table 2 shows the *t* test including the BF for the differences between when the effect took place inside the spectator's hand compared to elsewhere (i.e., under the box). There was no significant difference in the emotion ratings as a function of whether the effect took place in the spectator's hand or the box— although confusion was greater when the person made the choice themselves ($BF_{10} = 16.14$). Furthermore, we observed that the sense of engagement was greater when being involved in the trick ($p = .028$), altghouh not supported by the Bayesian counterpart ($BF_{10} = 1.83$). Lastly, confusion was greater when the card changed in the participant's hands compared to elsewhere ($p = .002$; $BF_{10} = 3.16$) The remaining BFs were all lower or close to one-thirds favoring evidence for the null hypothesis, although some of this evidence could be labeled as weak or anecdotal (depending on the terminology used—see Jarosz & Wiley, 2014). Figure 5 shows participant's mean ratings as a function of agency. There were no significant differences, though the largest difference was found for how anxious they felt ($BF_{10} = 1.27$). Table 2 shows the *t* test for the differences between when the spectators made the selection themselves and whether the effect took place inside their own hand or whether this occurred in another person's hand.

Table 2

Bayes t Tests Factors and Frequentists Analyses for Location and Agency

	Box versus hand				Self versus other			
Emotions	Bayes factor$_{10}$	*t*	*df*	*p*	Bayes factor$_{10}$	*t*	*df*	*p*
Amazed	0.23	0.69	130	.494	0.40	1.25	130	.214
Enjoyment	0.49	−1.47	131	.148	0.82	1.78	131	.077
Surprise	0.21	−0.51	131	.609	1.1	1.96	131	.053
Wonder	0.19	−0.20	130	.984	0.89	1.83	130	.070
Engaged	0.22	−0.54	127	.588	1.82	2.23	127	.028
Anxious	1.27	2.06	129	.041	0.32	1.02	129	.312
Confused	0.26	0.84	129	.401	16.14	3.16	129	.002
Amused	0.19	0.2	130	.983	0.25	0.71	130	.479
Interested	0.22	0.57	131	.567	0.51	1.44	131	.152
Excited	0.19	−0.47	131	.636	0.50	1.43	131	.156
Impossible	0.19	−.01	127	.998	0.82	1.77	127	.079

Many of the emotion ratings were significantly correlated (using frequentists analyses), but rather surprisingly impossibility ratings, only correlated significantly with being amazed and interested, sense of wonder, engagement, and excitement, and these correlations were relatively weak. However, their Bayesian counterparts ($BF_{10} = 8.68$ and $BF_{10} = 6.84$, for being amazed and engaged, respectively) suggest substantial evidence for such a relationship, suggesting that a weak relationship between those emotions and the experienced impossibility of the magic trick exists. Please see the online supplemental materials for an in-depth overview of these correlations.

To summarize, a magic trick that happens inside the spectator's hand does not necessarily elicit stronger emotions (except for anxiety) compared to when it happens elsewhere. Our experiment did, however, show that the sense of engagement and confusion that the participants felt is stronger when the participants make the selection themselves rather than they watch another person make the choice. Collectively, these results suggest that the location (hands vs. underneath a box) do not have a large impact upon the overall psychological experience of the magic trick.

General Discussion

Magic is a creative art form that allows us to experience the impossible, and magicians have acquired valuable insights into how best to produce these experiences. We tested several of these conjuring principles to examine the impact that they had on how people experience a magic trick. Magicians often go beyond breaking the third wall and directly engage their audience in their performance by asking them to participate in decision-making processes that are central to the trick. Experiment 1 showed that this active participation in the performance had a relatively minor impact on the emotions that the trick elicited but did lead to higher levels of anxiety. A previous study showed that some participants specifically commented on their dislike of being singled out to participate in a performance (Medeiros et al., 2022). However, in Experiment 2, we used a similar magic trick in which the spectators were asked to pick a card after which the card magically transformed. In this trick, spectators did not report significantly higher levels of anxiety when they were being selected; however, more anxiety was experienced if the card changed in their hands compared to underneath the box. Contrary to Experiment 1, in Experiment 2, participants reported higher levels of engagement when partaking in the trick versus when they did not. Feelings of engagement showed moderate to strong, positive correlations with experiences of wonder, amazement, enjoyment, surprise, excitement, interest, and amusement. These findings support

magicians' insight that active participation leads to increased overall enjoyment of the magic trick.

This finding fits well in the broader literature on the positive impact of participants' engagement and active participation. For example, Blasco-Arcas et al. (2013) showed that the use of clickers (i.e., audience response system) leads to increased engagement, which results in better academic performance. This is further supported by Mulongo (2013) who showed that partaking in classes led by highly engaging teachers who promote active learning and teaching resulted in better recall of class contents, higher pass rates, and more positive attitudes about the teacher, the subject, and the class environment. Our findings extend this line of research by providing compelling evidence that partaking in some magic tricks can result in an increase in overall enjoyment. Collectively, these results and previous research on active learning indicate that magic, as an art, can be experienced to a fuller extent if the spectator is involved in the magic. This provides an important direction for magicians, who do not, incorporate interactive elements in their performances.

Our second objective was to test two central concepts in magic. The first examined whether a card trick in which participants are asked to name a card rather than physically select it would be more impressive in magic. Contrary to magicians' insights, participants felt that a card selection in which they were asked to name a card was less free (similarly to Pailhes & Kuhn, 2023) and more prone to external influence than when they physically selected the card. Moreover, participants felt that the trick in which the spectator physically selected the card was more impossible, again contradicting the magicians' insight. Though this may be perceived as counterintuitive—affecting one's thoughts could appear as harder than affecting one's behavior—we argue that it is not. While science does not provide insight into how magicians are perceived by the public, here, we will assume that magicians are often perceived as mysterious, mind-messing individuals, who rely on a repertoire of techniques to affect one's mind (as well as possess the ability to read minds) and perception. If this assumption is correct, it would explain why our participants felt more ownership over their behaviors than thoughts. Moore (2016) described the sense of agency as "being in the driving seat when it comes to our actions" (p. 1). Magic tricks and magicians undoubtedly affect this sense of agency as seen in our results; people do not experience full freedom of choice (despite having it) when partaking in magic tricks. Our results indicate that a sense of agency over one's actions is stronger than one's sense of agency over one's own thoughts. Future studies should investigate this conclusion further.

Pacherie (2007) distinguished five approaches to understanding the sense of agency (see Pacherie, 2007, for further descriptions and evidence for each approach). The first is proprioceptive awareness, where the senses perceive the outcomes of an action. This suggests that physically selecting a card results in stronger proprioception compared to merely thinking about a card. The second approach, awareness of intentions, can be understood as a match between an observed action and a prior intention. Again, when merely thinking of a card, there is no observable action, which might then diminish one's sense of agency. The third approach, intentional binding, may also help explain the difference in experienced freedom (and the feeling of being influenced) between naming and selecting a card. Intentional binding refers to the perception of a match between one's action and the outcome (Pacherie, 2007). Haggard et al. (2002) showed that when pressing a button (a voluntary act), the perceived time of initiating the act is closer to the perceived time of the effect (a tone). In this context, the participants' physical selection resulted in a visible (and proprioceptive) outcome, as they could feel the card in their hands. In contrast, thinking of a card does not result in a physical outcome, so participants may experience less agency over this action, leading to stronger perceptions of influence by the magician. Similarly, Pacherie's (2007) discussion of the sense of initiation suggested that physical selection provides the participant with a stronger sense of initiation—their decision results in a tangible rather than imaginary outcome. Finally, the sense of control refers to having motor, situational, and rational control over the action. Here, we argue that having motor control over the action leads to stronger feelings of situational control, which in turn enhances the sense of rational control compared to naming a card, which lacks such motor component. Taken together, these findings indicate that thoughts do not feel as real as physical movements, suggesting that humans may feel more in control of their actions than of their thoughts.

In Experiment 2, we tested another central idea in magic—a trick that happens in the spectator's hand is more impressive. Even though the vast majority of magicians endorsed this claim, our data found no evidence to support it. Participants rated a trick in which a playing card transformed into a previously chosen card as no more effective when the transformation happened in the spectator's hand than when it happened elsewhere. This further supports the notion that active engagement has no impact on how close-up magic is perceived by the spectator. A potential explanation could be that the effect of this particular magic trick is so strong, as it redefines object permanence and the location of where that happens plays a secondary role for the participants. The participant explores the possible explanations of how it could have happened, rather than where it happened. This conclusion, however, warrants additional testing in the future.

This study does not come without limitations. First, we only used one type of trick—a card trick; therefore, our results should be carefully extended to the wider variety of magic tricks—that is, mind reading tricks, or stage magic, like sawing a person in half. Furthermore, the participants might have experienced lesser ownership over their thoughts as they were subject to a psychological experiment while partaking in a magic trick, which might have further enhanced their suspicion. Barrett et al. (2025) argued that participants' suspicion is a likely problem when dealing with psychological research, which is often not adequately addressed, if at all. Therefore, future studies could include suspicion probes (i.e., do you really believe that your mind was "hacked" by the experimenter?). We chose to test two magic principles because they were widely accepted within the magic literature and because they could be easily tested using scientific methods. The fact that we failed to find evidence to support these two theories does not imply that magicians do not have valid insights into how some of their tricks work. However, we urge caution when taking anecdotal claims at face value and encourage the scientific and artistic community to use empirical approaches to complement their more established theoretical and applied approaches to magic.

In the current study, we showed compelling evidence that magicians' assumptions about the involvement of their audience, despite having extensive experience in performing magic, are not always correct. Naming a card rather than picking a card, as well as having the magic happen in the spectators does not lead to greater surprise or greater perceived impossibility of the magic trick. It only affects the fear levels, which are experienced to a greater extent by the persons taking part in the trick versus merely being the spectator. Active

engagement in a magic trick, however, leads to greater engagement, which supports magicians' conclusions. These findings provide important insight into the feelings that magic evokes, enabling magicians to further improve their art.

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Received March 15, 2024
Revision received January 17, 2025
Accepted January 22, 2025 ■