

# The Magical Art of Technical Presentations

## Editor's Note

At the time of publication, all of the links in this article were operational. However, since we do not host the videos, we have no control over whether or not they will continue to be active. In many cases, similar or related videos can be found by typing the performer's name in an appropriate search engine. For convenience, all of the referenced links can also be accessed at [www.fourhandedillusions.com/matp](http://www.fourhandedillusions.com/matp). On occasion, new and related links might also be posted on that site.

Teaching is, after all, a form of show business.

—*Steve Martin*

Performed well, magic and technical presentations can be thought of as two performing arts with different objectives. The primary goal of a technical presentation is to inform, to effectively communicate knowledge and novel ideas from the presenter to the audience. The primary goal of a magic performance is to mystify and entertain. As different as they are in purpose, magic and technical presentations share a lot in common. Seasoned presenters, like great magicians, have to communicate effec-

tively, command the stage, engage their audiences' attention, capture their curiosity, and leave them with a sense of fascination and wonder. We don't believe every class or lecture has to be a show to be effective. But we do believe that every presentation in front of a technical audience can benefit from careful consideration of some of the concepts we offer in this article, and especially when it comes to singular talks and presentations of technical work for colleagues, management, or potential employers.

Both of us have strong interests in science, technology, presentations, and magic but in different ways. Several years ago, we entered into a wonderful arrangement, with Joel Acevedo offering to tutor Al Oppenheim in magic in exchange for Oppenheim tutoring Acevedo in signal processing. This article is one outgrowth of that wonderful interaction and friendship and is our attempt to articulate our perspectives on how performing magic can inform impactful technical presentations.

We've organized the article into five main sections. The "Body Language of a Magician" section discusses body language and its importance in communicating during a presentation. The "Understanding the Venue" section briefly discusses considerations related to the venue. The "Elements of the Performance" section focusses on issues related to designing a performance, including developing the script, opening and closing a presentation, the use of

props, and the importance of the reveal. We then elaborate on the importance of practice in perfecting the elements of a performance in the "How Do You Get to Carnegie Hall?" section. We close with a few additional thoughts borrowed from hockey players and rock climbers in the "And Now for Our Closer ..." section. Links to the performances and demonstrations that we reference throughout can be found in "Editor's Note." For convenience, all referenced links can also be accessed at <https://www.fourhandedillusions.com/matp>. We hope that, by the end of this article, our readers will have been entertained and exposed to concepts from magic that they can incorporate when designing and presenting technical work to improve the effectiveness, impact, and overall value of their presentations.

The role of a magician is to make simple things appear mysterious.

The role of a teacher is to make mysterious things appear simple.

—*Al Oppenheim*

## The body language of a magician

As is well known, when performing for an audience or just when interacting with others, voice is only one of the many ways that we communicate. The persona that we present and the use of our hands, eyes, feet, and overall body movements also communicate either implicitly or explicitly. While our comments in the following sections are mainly phrased in the context of performing magic, they clearly

apply either directly or are easily modified to apply to technical presentations.

### Choosing a persona

While each of us has a certain natural persona when interacting with friends, family, and colleagues, it's often important and useful to project a different and carefully thought through persona for a performance. For us, this quickly brings to mind the victory speeches by Kamala Harris and Joe Biden on 7 November 2020, following the outcome of the popular vote count for vice president and president. Among the strongest and possibly the most memorable statements that they made happened before they uttered a word. Harris wore all white, an homage to the white outfits often worn by suffragists during their fight to get women's votes recognized. Biden, typically characterized by his opponent in the election as old and low energy, energetically trotted rather than walked to the podium.

The importance of the stage persona is true whether it is a performance by a magician, an important technical presentation related to a job interview, or a presentation to research sponsors and colleagues. It has long been understood by seasoned performers that as they first enter the performance space (the stage, podium, or lecture hall), the audience forms a first impression from the way the performer moves and is dressed and the body language that he or she presents.

A presenter might choose to present himself or herself with an authoritative and commanding persona or one that casually suggests informality and approachability. Among magicians, there are particularly diverse personalities that are evident. In a magic performance, the persona of a "wizard" is sometimes chosen to suggest to the audience that a magician truly has magical and superhuman powers. A good example of this is Kim Silverman [1], a principal research scientist at Apple Computer and a professional magician. Other magicians might choose to reflect sophistication and elegance. Excellent examples of this persona are magicians Channing Pollock [2] and Rocco Silano [3]. A particularly interesting persona in the community of magicians is that chosen by Lennart

Green [4]. His persona was nicely summarized by Geoff Tibbs, in the September 2013 issue of the *Journal of Performance Magic* [5], as an awkward office-bound IT worker combined with an embarrassing distant uncle. While the diversity of options might well be more limited with a technical presentation, the basic principle is the same, and we think the choice of persona should be made in advance carefully and consciously.

### Hands

Spectators tend to focus lots of attention on the hands of a magician to try to catch the moves. For this reason, magicians spend a lot of time thinking about how to make their hands look natural. It is particularly helpful to observe how hands look in the wild, e.g., in casual conversation with friends while standing, sitting, in motion, or at rest, so that these natural positions and movements of the hands can be mimicked during the performance. One of the most difficult positions to feel comfortable with tends to be when the hands are at rest. The rest position, as it is referred to in magic, should communicate clarity and openness. For a magician, the rest position is an element of suggesting that nothing is being hidden, especially when something is!

Similarly, when the hands are not being used to explicitly communicate in a technical presentation, a neutral, comfortable, and relaxed position of the hands is typically best. At a podium or table, simply resting one's relaxed hands on it is natural and esthetically pleasant. Another technique for having hands appear relaxed and natural is to hold something, for example, a pointer or a piece of paper. According to legend, this principle is the origin of one of magic's most ancient props: the magic wand. Hundreds of years ago, when sleight of hand was very rudimentary, magicians successfully used the magic wand as a way to secretly hide objects in the hand while feeling and looking natural. The late Prof. Patrick Winston, in his famous yearly talk at the Massachusetts Institute of Technology (MIT) on speaking and presentations [13], offers another piece of advice about hands: with or without a pointer, pointing to the slides or white-

board is a way to give the hands something to do while achieving naturalness.

### Eyes

Magicians understand that the gaze instinctively commands and directs the attention of others. That's why they abide by the following simple yet effective principle: if you want others to look at something, you look at it; if you want them to look at you, look them in the eye. This principle easily translates to technical presentations, as well. If you want the audience to look at you, look at them; if you want them to look at the screen, look at it yourself.

Whether in one-on-one conversation or with a large audience, making eye contact keeps the audience engaged. As a technique for maintaining eye contact with a large group throughout the performance, magician Juan Tamariz proposes the following mental visual in his book *The Five Points in Magic*. Imagine that every time that you sweep the audience with your gaze, imaginary threads are thrown from your eyes to the eyes of the audience members you see. When first thrown, the threads are taut, but as time passes, the threads start to loosen. To tighten them and keep your audience's attention, look at it again. It's important to cycle through the audience enough to keep those threads as tight as possible.

Making eye contact with the entire audience within the first minute of the presentation is particularly important to keep everyone engaged. A technique that we have found to be helpful is to utilize a phrase during the opening of the presentation that has three distinct parts. Mentally associate each part of the phrase with a section of the room, e.g., left, center, and right, in that order. When each part of the phrase is spoken, we make a point of looking at the corresponding section of the room. If the phrase is rehearsed with the actions, it will be hard to deliver the phrase during the presentation without sweeping the room with your gaze.

### Voice

Magicians use their voice both to communicate and deceive. To achieve those objectives, performers need to use their voices to reach the audience and retain

its attention. Even when the speaker's voice is amplified, it is important to project the voice to everyone in the room. In a magic performance, performers purposely try to elicit a reaction from the audience to get feedback as to whether their voice is reaching the farthest parts of the room. In a technical presentation, it might not be as straightforward, but this concept still applies. Making eye contact with and getting visual feedback from all parts of the room is one important element in confirming that your voice is reaching everyone.

In social settings, fillers, such as *um*, *ah*, and *you know*, can serve the function of keeping the flow in the conversation while constructing the next thought. In a presentation, these often adversely affect the message and reflect that the presenter is not comfortable with silence. In contrast, pausing in silence is often powerful and highly effective. It can dramatically capture the attention of the audience at the most important points in the presentation.

In magic, an important rule of thumb is to surround the climax of an illusion with pauses. As noted by magic theorist Arturo de Ascanio, the pre-effect pause is meant to cause suspense or a sense of anticipation in advance of the approaching climax. The post-effect pause, often referred to as the *assimilation pause*, gives spectators an opportunity to digest, react, and enjoy the magical moment before additional information is thrown at them. The late Eugene Burger was a master of dramatic pauses, and his rendition of the classic cut-and-restored thread [6] is a great example.

## Understanding the venue

In many cases, it is the venue that dictates the type of performance or presentation that can be done. Magicians typically develop different types of illusions and communication styles to perform in a variety of venues. Magic performances tend to be categorized as either close-up, parlor, or stage, depending on the venue and audience size for which they are most appropriate. There is clearly a similar variety in technical presentations. A successful presentation is often dependent on the performer

understanding the venue and, if possible, having some control over its details. For instance, the size of the audience and space will impact the visibility to the audience of the slides or props. Similarly, it is important for the performer to understand the acoustics of the venue. Even the choice of the microphone makes a difference in what can be done on stage. In many cases, issues related to the venue can be addressed in advance with appropriate requests. At a minimum, it's important for the presenter to have, in advance, as accurate a picture as possible of the features and limitations of the venue and audience placement to plan appropriately.

## Elements of the performance

In this section, we discuss some of the concepts that are important when designing a magic performance and that we have also successfully applied to our own technical presentations. An important question to consider early in the design phase is, What is the experience that you want the audience to have?

### Develop patter

The term *patter* is commonly used among magicians to denote the story that accompanies a trick. A simple and somewhat dull patter to introduce the classic cup-and-ball routine could sound something like this: "Here I have a cup and a ball. If I put the ball inside my pocket and snap my fingers, the ball magically jumps back to the cup." This simple expository patter supports the magical effect but lacks the entertainment and theatricality that could make an illusion more interesting, impactful, and memorable. The legendary British magician Paul Daniels was a master at designing patter that was both relevant and entertaining. The patter in his version of the cups and balls is an excellent example [8].

Creating patter that supports the plot of a trick and entertains is not a simple task. It is typically an iterative process that starts with writing a script. Writing a script has several advantages over the alternative method of speaking extemporaneously over a series of memorized bullet points. We personally have found that the same advantages apply to our technical presentations. Writing out a script

facilitates the process of choosing every word for maximum communication, power, and impact. Magicians know that every word counts, and often the same is true for technical presentations. Having the patter in writing makes seeing, evaluating, revising, and comparing word choices more explicit and convenient.

Having a written script also allows for experimentation with intonation, volume, and timing during rehearsals. Being able to read the same text over and over again, without having to memorize it first, can prove very useful during the early stages of rehearsal. Whether presenting a magic trick or a technical talk, performers are almost always bound by a time limit. Making the patter more precise, concise, or slightly faster can be the difference between staying on time and going over a time limit. In addition, having a written record of the patter is helpful when planning to present the trick again at some future time. Similarly, with technical presentations, speakers typically store their scripts with their slides for future presentations.

Creating a first draft of a script can be a daunting proposition. One approach is to record an organic run-through of the slides and then transcribe the recording's audio. A concern we've encountered when talking to magicians and presenters alike is that writing and learning a script could unintentionally lead to sounding robotic or overrehearsed. To avoid this, we recommend practicing the script until it becomes second nature. At that point, the presenter can focus on rehearsing how to deliver words in a way that sounds conversational and extemporaneous. Whether deciding to memorize the script word by word until it sounds natural or just reading through many times until the key points are deeply ingrained, carefully developing the patter greatly benefits presentations.

### Closing doors

In magic, it is important to know where the mind of the spectator is at all times. Knowing when spectators might be suspicious helps magicians devise ways to take the minds of the spectators away from that suspicion and create magic. The systematic elimination of pathways

to all possible explanations, real or not, of the magical effect is called *closing doors*. As an example, it is a common assumption that magicians hide things up their sleeves. To “close that door,” magicians may make a point of rolling up their sleeves before vanishing a coin. It could be done with sleeves down, but that will let the spectator formulate a possible explanation to the magical effect. It is only when spectators cannot latch onto any possible explanation that astonishment is produced.

When presenting technical ideas, the paths that we try to close are, of course, not those leading to secret methods but to questions about our content. Confusing sections and elusive concepts in the presentation can be identified during practice runs and fine-tuned before standing in front of an audience. To that end, it is important to elicit honest feedback from practice audiences; we note any questions, requests for clarification, and comments our colleagues express and consider those for modifications. More often than not, these comments will be representative of those our real audience will have. Addressing each one of these comments in a new version of the presentation, whether it is by modifying the slides or the script that accompanies them, can effectively close the paths to confusion for future audiences. We should say that in a magic performance, there are times when the spectators are purposefully led to think they have figured out how a trick is done so that the magician can close that door later in the trick in a surprising way. This will be returned to shortly when we discuss the reveal.

### *The opener*

The term *opener* refers to the first trick of a magic performance. This trick is typically designed to be short and to quickly capture the attention of the audience. It should also establish the stage persona of the performer while giving the audience a good sense of what to expect for the rest of the performance.

We’ve learned from great magicians and through our own experience that starting a show with such a piece of magic creates a more receptive audience and, consequently, a better show.

The legendary illusionist David Copperfield often opens his shows by magically appearing out of nowhere in a dramatic, artistic, and spectacular way [9], characteristics associated with his style of magic. Appearing out of nowhere to open a technical presentation isn’t necessarily recommended—unless you really, really want to. But, as we discuss in the following paragraphs, there are many ways to start a technical presentation that share the features of a magic opener.

Quite likely before the presenter does or says anything, the first slide is visible to the audience. That, by itself, makes this slide part of the opener. Unfortunately,

too often the first slide isn’t given much creative thought. A commonly used format typically includes the speaker’s name, the institution, and the title of the presentation. To achieve the

main objectives of the opener, the title of a presentation needs to be an attention grabber. Very often, presentation titles are long and detailed, many of them giving away the punchline of the presentation too soon. We suggest that the opening slide be treated as a headline and not an abstract. The goal of a headline is to provoke curiosity and to motivate the audience to read the whole story. In the same way, a short stimulating title with graphics that sparks interest constitutes a much better opener than a long jargon-filled one.

Now come the first words and interaction with the audience. There are several approaches that are effective both in magic and technical presentations. One is to start with a humorous remark. An example from the world of magic is Larry Wilson’s opener, the vanishing glass [10]. Oppenheim also uses this approach regularly in academic settings, sometimes opening with some cards, ropes, rings, or a “magic” tie, as used in [11] during his welcome remarks at an MIT student orientation.

Laughter helps to get those who are paying attention relaxed and engaged and can capture the attention of those who were initially distracted. Used carefully and with taste, this is often a great way to get everyone on the same page before introducing the key substance of the work. That is exactly how Sir Ken Robinson begins his 2007 TED Talk “Do Schools Kill Creativity?” [12]. He engages the audience immediately through humor, establishes his persona, sets the tone of the presentation, and lets the audience know that it will be acceptable to laugh at his jokes in an otherwise serious presentation.

Another approach is to start with a question related to the main theme of the presentation. This question could be rhetorical or an actual survey of the audience’s opinion, which would engage them all at once. Asking a question was a favorite opening technique of the 19th century Viennese card master Johann Nepomuk Hofzinsler, who started many of his enigmatic parlor demonstrations with a question, such as, “Do you believe that I can give you your own thoughts in concrete form even before you, yourself, are conscious of it?”

The physicist Dr. Richard Feynman was one of the greatest scientists of our time as well as a master teacher and performer. He truly knew how to make mysterious things appear simple while educating, motivating, and entertaining his audience. Among the many anecdotes is one in which at the beginning of a class on probability, he began with something like,

The most amazing thing happened to me on my way to class this morning. I was stopped at a red light, and right in front of me was a car with the license plate PR6G5T. What is the probability of that?!

Announcing that the event was “amazing” was a bit of misdirection, as it conditioned the audience to expect an extraordinary explanation of a very low-probability event. Feynman’s students were misdirected away from the more obvious answer of *one* since the event he was referring to had already happened. This clearly focused their attention as he

**Laughter helps to get those who are paying attention relaxed and engaged and can capture the attention of those who were initially distracted.**

explained the difference between a priori and a posteriori probability.

Burger, in his writings about the performance of strolling magic, suggested another approach that is also very common among seasoned speakers. His approach was to start with an enticing promise. Burger would approach a group and say something like this: “My name is Eugene Burger, I’m a magician, and if you have a couple of minutes, I would like to show you something amazing that you will remember for a very long time.” This is what Prof. Winston referred to as the *empowerment promise*. Telling the audience up front what it will gain from listening to you is a powerful way to capture its attention and put it in a receptive mood for the body of the presentation. As you may have noticed in the introduction of this article, we followed our own advice and included an empowerment promise in the final paragraph.

A short demonstration providing background or illustrating the problem at hand can also be a great way to open a presentation, as we discuss further in the following section.

### *The importance of props and choosing the right ones*

The term *props* (i.e., “theatrical properties”) originated to describe objects used in a stage play and similar entertainments to further the action. In magic, props are the means through which the performer demonstrates “supernatural” powers. Cards, coins, and silks are just a few of the objects magicians levitate, vanish, produce, and change to amuse and amaze. The choice of props in magic is seldom arbitrary. Magicians discovered ages ago that certain props can help make their illusions more effective than others. Take the classic effect of a solid penetrating another solid. Hundreds of versions have been developed throughout the centuries, but only a small percentage of those is part of the repertoire of the modern professional magician. The linking rings illusion [14] is a great example of a successful version, which, we argue, is in great part due to the props utilized. The rings are large and made out of metal, making them highly visual. Moreover, metal not only looks

and feels like a rigid solid but also sounds like it.

Compare that to the more modest yet amazing version of the same trick using playing cards [15]. Here, the cards are smaller, making the effect less visual. They are made out of paper, which is thin, flexible, and easier to tear than steel. It’s the same effect as the linking rings, but it doesn’t have the same impact, due to the characteristics of the props used. Perhaps one of the strongest versions of the effect of objects passing through each other is the version by the Pendragons [16] in which the two “objects” are the magician and his assistant. The “props” in this version are unmistakably solid (two human bodies), with the added emotional hook that the element of danger is introduced. It is a clear and memorable impossibility. In addition to using props, we recommend spending some time choosing ones that not only illustrate the point but also do so in a dramatic, humorous, and/or unusual way.

Many legendary teachers are masters at conveying knowledge in clear and understandable ways while also punctuating their presentations with creative demonstrations that are more akin to a performance than a lecture. Among our many favorites is the dramatic demonstration by Prof. Walter Lewin of the conservation of energy, utilizing a pendulum consisting of a steel ball attached to a long cable [17]. The selection of a large steel ball attached to a cable evokes images of a wrecking ball attached to a crane and about to smash a concrete wall. A small pendulum would have also illustrated the same concept but without the strong emotional hook and to a lesser impact. The choice of props matters.

### *The closer*

Magicians know that when an audience leaves the theater, it will almost always remember at least the first and the final trick of the show. The closer is chosen to leave the audience with a strong lasting impression, including what the performer might like the key “takeaways” to be. Typically, it is not the strongest or most novel piece in the show, but it serves as a reminder of who the magician is and what he or she and the audience have

experienced together throughout the performance. It’s interesting to note the subtle way in which illusionist Lance Burton ended his otherwise spectacular 1997 TV special. In his closer [18], he waved farewell with a magic piece but not before reminding the audience of the purpose behind all theatrical magic.

Too often in technical presentations, the ending is disregarded. Prof. Winston would always emphasize the importance of the end of a technical presentation. As he commented, the ending will often be remembered either because, sadly, the talk just drifted to a close, or it ended by dramatically emphasizing something impactful. He recommended, for example, that the final slide be a summary of your central thesis and contributions as opposed to a list of acknowledgments or a big question mark with the text “any questions?”

The closing is also a great moment to recap the empowerment promise and how you think it was achieved. As with the opener, a humorous remark related to the topic of the presentation as a closer can bring the whole presentation full circle. If you want your audience to follow up with you in the future with questions or comments, it’s helpful to encourage them to do so as part of the closer and to include your contact information in the final slide.

### *The reveal*

Thomas Stockham Jr. was one of the pioneers of digital signal processing and is widely acknowledged as the father of digital audio [19]. Stockham was a masterful teacher and presenter who knew how to build drama and impact into any important technical presentation. Among his many outstanding technical accomplishments was his work on the restoration of old vinyl recordings. In presenting the work, there were many choices of recordings that he could have made. For impact, he chose a particularly famous recording of Enrico Caruso singing the aria “Vesti la Giubba.” The restoration involved first compensating for the frequency characteristics of the traditional “morning glory” mechanical recording horn and then removing the noise after this enhancement. When presenting this work to large audiences, he

would typically explain in advance how the first level of enhancement would sound: crisper and with the higher frequencies enhanced. But then he would surprise and astonish the audience when he would reveal that the subsequent stage of removing the noise also removed the orchestra since the method used was to remove any aspects of the recording that could not be reproduced with a model of the human vocal tract. As far as we're aware, there are unfortunately no video recordings available of Stockham's magical presentations of this work. While not intended to illustrate or reproduce the drama with which Stockham would routinely astonish the audience in revealing the result, we include a link [20] to a classroom presentation by Oppenheim of the restoration so that the reader is able to experience the result.

Any magical illusion typically climaxes with "the reveal," and so there are likely to be several of these during a performance. The magician reveals, for example, that a chosen card is known, that an item has vanished, or that a silk has changed into a dove. It is typically at this moment that the spectator experiences a sense of wonder and astonishment. That is the reason why magicians spend significant time experimenting with different ways to reveal the magical effect. Consider, as an example, finding and showing a previously selected card. The direction in which the card is turned, the timing, and whether to show the card's face in silence or accompanied by a clever remark are just a few of the variables that can be modified to generate different gradients of emotion. Notice the extent to which sleight-of-hand master Armando Lucero goes to create suspense in the revelation of a card previously thought of by a TV show host. The strong emotional reaction the trick generates has a lot to do with Lucero's presentation, especially the reveal [21].

Lucero's performance is an example of how suspense can increase the potency of the reveal. He does it by letting the spectators infer at the top of the trick that the jokers will find the thought-of card. Slowly and progressively, the jokers move in the pack, creating a sense of anticipation. Even when the jokers have

sandwiched only one card, he pauses further before giving the audience what it already knew with the reveal. A bit of suspense can also make the reveal of novel technical results more impactful. The effect can be generated by telling the bottom line up front and slowly yet progressively taking your audience through the important developments that led to your conclusions, results, or product.

In addition to suspense, surprise is the other prevalent emotion in effective magic reveals. In the section "Closing Doors," we discussed how magicians typically avoid leaving loose ends in their performances that can be used by the audience to conjecture an answer as to how a trick is done. There is also the possibility of opening false doors, a technique that we borrowed from magic and use in our own presentations to make the reveal more surprising and, consequently, memorable. Specifically, sometimes magicians purposefully lead the audience to think that it has discovered how a trick is done so that the magician can later eliminate that solution and add surprise to the performance. This is an approach that can often be seen in the classic egg bag routine, as shown in this clip by Martin Lewis [22]. This technique can also be applied to technical presentations to amplify the sense of surprise when a key result is revealed.

Perhaps among the best examples of a surprising reveal that we've seen in a technical presentation is that used by Dr. Amar Bose when first presenting to a large audience a new speaker technology and product by Bose. On the stage in a large auditorium, the audience saw two narrow tall structures draped in black cloth, reminiscent of, for example, large electrostatic speakers. At the end of Dr. Bose's technical presentation, the new speakers were demonstrated with impressive audio, but still with the cloth in place. Toward the end of the demonstration, the cloth drapes floated to the ground and revealed two small cube speakers, of  $3 \times 4 \times 6$  in each, sitting on top of a tall narrow stand. Of course, neither the stand nor the cloth had anything to do with the audio quality of the speakers. They were used to lead the attendees to think that such high-quality

audio was being produced by a large device, only to surprise them with the extraordinarily small size of the actual speakers. Technical presentations might not always have the opportunity for the same level of drama in the reveal that a magic trick might have. But careful thought and planning in making the reveal unexpected, suspenseful, or emotionally engaging in different ways can help the audience remember the presentation for a very long time.

## How do you get to Carnegie Hall?

If I don't practice one day, I know it; two days, the critics know it; three days, the public knows it.

—Jascha Heifetz

Seasoned presenters and performers understand that the only way to the flawless execution of each element is through practice. Only when each becomes second nature is it possible to totally focus on communicating and creating an astonishing experience for the audience. In this section, we'd like to remind the reader of this essential principle and indicate a few points that we have found to be useful and essential as part of a practice regimen. While we phrase these specifically from our experience with magic, they all directly apply more broadly.

### *The camera is your friend*

Usually, what magicians see from their perspective is, and should be, different than what the audience sees from its. That's why many magicians practice in front of a mirror. It's well known that when practicing in front of a mirror, magicians will often and unknowingly have a tendency to blink during a move that they don't want the audience to see, a habit that they unknowingly transfer to their performances. Sometimes it is evident that a magician practices only in front of a mirror by whether or not he or she blinks when performing a secret move. This happens because the practitioner intuitively doesn't want to see her/himself doing something wrong at the critical moments. The use of a camera is a better way of getting a more accurate representation of what our audience would see. The same is true when it comes to

technical presentations. Utilizing a camera can be useful in studying and refining the “soundtrack” and motions, as the presenter is able to see what the audience will actually perceive.

### Practice with muggles

Feedback from an audience of friends and peers familiar with the elements of a performance is of course valuable. But our magician friends perceive and react to magic differently than nonmagicians. Since magician audiences are particularly concerned with the method to achieve an illusion, it is easy for them to lose sight of the presentation, impact, and entertainment value of a magic performance. Muggles are more likely to help in pointing out weak points about those presentational aspects of the performance. In a very similar way, feedback from a dry run of a technical performance with muggles, i.e., nonspecialists, will likely uncover issues with the visual elements and the style of the presentation that would otherwise elude specialists.

### Practice out loud

In his book, Tamariz recommends practicing the patter of a trick by exaggerating both the volume of your speech and the natural facial expressions that typically accompany it. This practice technique has two purposes. First, the fact that you hear yourself can help with memorizing a script and improving intonation. Second, the process of exaggerating facial gestures makes your face muscles “learn” what they have to do and in what sequence. This aids in memorization and intonation but also can help to better enunciate. We have personally found this useful during the latter part of the practice phase and as a warm-up exercise shortly before a technical presentation.

### And now for our closer ...

We’ve found inspiration in National Hockey League players and famous rock climbers to offer a final suggestion. There have been many articles written about how professional hockey players have benefited from figure skating lessons [23]. Similarly, Adam

Ondra, the world-class rock climber, has taken ballet lessons to improve his climbing performance [24]. In the same spirit, we seriously suggest that a path to improving the performance of technical presentations can be through performing magic. You may not want to become a serious magician (although it is addicting, and you might well enjoy it), but learning, perfecting, and performing just one or two magical effects can help focus attention on aspects of performance that can work best for you. This is an exercise Oppenheim has done with his students throughout the years, with great results. To get you started and as a suggestion to our readers, we have recorded a short tutorial to learn a very simple card trick. You can find a link to a performance [25] and explanation [26] of the trick in “Editor’s Note.” We hope you enjoy it!

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### References

[1] K. Silverman, TEDx, San Jose, CA, USA. *Making Magic Meaningful*. (Apr. 18, 2011). [Online Video]. Available: <https://www.youtube.com/watch?v=n5rwYnj2GZQ&t=13s>

[2] C. Pollock. *Dove Act Magic*. (Oct. 31, 2011). [Online Video]. Available: <https://www.youtube.com/watch?v=khQT5HP3zfU&t=26s>

[3] R. Silano. *Award Winning Performance by Magician Rocco in Paris France*. (Feb. 4, 2014). [Online Video]. Available: <https://www.youtube.com/watch?v=4E1JOrHGF4I&t=55s>

[4] L. Green. *Close-up Card Magic with a Twist*. (Aug. 21, 2008). [Online Video]. Available: [https://www.youtube.com/watch?v=1\\_oa8m5Oq00&t=208s](https://www.youtube.com/watch?v=1_oa8m5Oq00&t=208s)

[5] G. Tibbs. “Lennart Green and the modern drama of sleight of hand.” Informat. [Online]. Available: <https://search.informit.org/doi/10.3316/INFORMIT.643979824471237>

[6] E. Burger. *Jeff McBride: A Magical Life*. (May 29, 2010). [Online Video]. Available: <https://youtu.be/405xMmDpCZs?t=7>

[7] Bill Gates. *The Next Outbreak? We’re Not Ready*. (Apr. 3, 2015). [Online Video]. Available: [https://youtu.be/6A16b\\_wyiw1?t=12](https://youtu.be/6A16b_wyiw1?t=12)

[8] P. Daniels. *Cup and Ball Magic*. (Oct. 5, 2011). [Online Video]. Available: <https://www.youtube.com/watch?v=gkkIEC8gkHM>

[9] *David Copperfield’s Opener*. (Jul. 8, 2011). [Online Video]. Available: [https://www.youtube.com/watch?v=nA8\\_w3GON\\_g](https://www.youtube.com/watch?v=nA8_w3GON_g)

[10] *Larry Wilson’s Opener*. (Jun. 14, 2021). [Online Video]. Available: <https://www.youtube.com/watch?v=0dCNLU8Umb4>

[11] *Al Oppenheim’s Magic Tie*. (Jun. 15, 2021). [Online Video]. Available: <https://www.youtube.com/watch?v=6mCXWCvA8kc>

[12] K. Robinson. *Do Schools Kill Creativity?* (Jan. 7, 2007). [Online Video]. Available: <https://youtu.be/iG9CE55wbtY?t=25>

[13] P. Winston. *How to Speak*. (Dec. 21, 2019). [Online Video]. Available: <https://www.youtube.com/watch?v=Unzc73iCUY>

[14] M. Lewis. *Linking Rings*. (Jun. 6, 2015). [Online Video]. Available: <https://youtu.be/I1YOpvChIDM>

[15] D. Copperfield. *Linking Cards*. (Jul. 19, 2016). [Online Video]. Available: <https://www.youtube.com/watch?v=pVPuCN0c2g>

[16] *The Best of Magic the Pendragons 5*. (Nov. 30, 2010). [Online Video]. Available: <https://youtu.be/5cDVAdVgC5o?t=28>

[17] W. Lewin. *Teaches Physics (Fun Video)*. (Jan. 24, 2016). [Online Video]. Available: [https://youtu.be/Zw1bp1V\\_RwA](https://youtu.be/Zw1bp1V_RwA)

[18] *Lance Burton the Encounter 1997 TV Special*. (Jul. 9, 2013). [Online Video]. Available: <https://youtu.be/PCFCTIGlayQ?t=2662>

[19] “Thomas Stockham.” Wikipedia. [Online]. Available: [https://en.wikipedia.org/wiki/Thomas\\_Stockham](https://en.wikipedia.org/wiki/Thomas_Stockham)

[20] *Al Oppenheim Presenting Stockham’s Demo*. (May 3, 2022). [Online Video]. Available: <https://youtu.be/EHtgpwUAV1Y>

[21] *Armando Lucero on Japan Magic TV Show*. (Nov. 6, 2010). [Online Video]. Available: <https://youtu.be/g5rm-AepH3E?t=204>

[22] *Martin Lewis Performs the “Señor Mardo Egg Bag.”* (Jun. 27, 2013). [Online Video]. Available: <https://youtu.be/A5pCyXrPwWk?t=56>

[23] *National Hockey League Players Get Figure Skating Lessons*. (Apr. 16, 2015). [Online Video]. Available: [https://www.youtube.com/watch?v=l\\_Qkp2HxHao](https://www.youtube.com/watch?v=l_Qkp2HxHao)

[24] P. Blažek. *Adam Ondra Does Ballet: The Secret Essence of Success*. (Apr. 11, 2019). [Online Video]. Available: <https://www.rockanddice.com/videos/climbing/adam-ondra-does-ballet-the-secret-essence-of-success/>

[25] *Magic Tutorial (Performance)*. (Jun. 23, 2021). [Online Video]. Available: <https://youtu.be/WKGj-Q2HpDE>

[26] *Magic Tutorial (Explanation)*. (Jun. 28, 2021). [Online Video]. Available: <https://youtu.be/SnhYw9ceoY>

