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Got a Spark with Brook? Engaging Consumers in a Sexual Health Campaign through the Use of Creative (Metaphorical) Double Entendres

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ABSTRACT

This paper describes a study conducted in collaboration with a marketing agency and a nonprofit organization (NPO) providing regional sexual health services, which included advice on, and testing for, sexually transmitted infections (STIs). The study investigated the relative effectiveness of different formulations of double entendres on appeal, humor, the likelihood of social media engagement, and intention to seek more information about STIs. Advertisements containing double entendres were significantly more appealing and humorous if: (1) the grammatical formulation did not cue the intended meaning; (2) the double entendre involved a creative meta-phorical expression; and (3) the double entendre referred to the middle part of the sexual scenario, referring to action rather than intent or result. Participants' ratings varied very little according to their age, gender, and education. However, a qualitative investigation of the free-text responses revealed that there was some variation in the types of interpretations that were offered by participants depending on their age, gender, and education. The marketing agency incorporated our findings into their live campaign, which resulted in a notable increase in: (a) website traffic and social media engagement; (b) STI home-testing kits ordered; and (c) STI kits returned for testing, compared with previous campaigns.

Introduction

In 2018, a total of 447,694 cases of sexually transmitted infections (STIs) were diagnosed in England, which constituted a 5% increase from 2017 (Public Health England, 2018). Sexual health is a stigmatized and embarrassing topic for many people, and this can make them unlikely to disclose health concerns, or access testing and treatment. As a result, infections often go untreated and thus proliferate (Baylis, Buck, Anderson, Jabbal, & Ross, 2017; Hood & Friedman, 2011). For this reason, public and private health services need to find effective ways to communicate about sexual health and dispel the stigma surrounding it. In order to attract attention and change public behavior, they need to develop awareness-raising campaigns that present this sensitive, taboo, and potentially stress-inducing topic, in a striking and memorable way.

One way in which they might do this is through the use of humor. Humor involves the subversion of an expected script, resulting in a degree of incongruity that needs to be resolved (Attardo, 1997, 2010). It often involves an element of surprise (Eisend, 2018). When used in advertising, humor has been found to elicit positive attitudes toward the product due to its ability to attract attention, to trigger emotional arousal, and to be processed quickly (Eisend, 2009). Furthermore, the use of humor in advertisements has been found to enhance consumer take-up of the messages they seek to convey

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(Sparks & Lang, 2014). The use of humor is particularly well-suited to the presentation of sensitive, taboo, and potentially stress-inducing topics, such as sexually transmitted infection. This is because of humor's ability to reduce levels of fear and threat through a process of "emotional shifting from a neutral or negative emotional state to a positive one" (Chan, 2014, in Chen, Chan, Dai, Liao, & Tu, 2017, p. 282; Henley & Donovan, 1999). Furthermore, the use of humor has been shown to be an excellent device for mitigating potential embarrassment (Chapple & Ziebland, 2004). The disinhibiting effect of humor allows taboo topics to be presented in a way that is more socially acceptable, resulting in more positive evaluations of the content they contain (Krishnan & Chakravarti, 2003; Ziv & Gadish, 1990).

A potentially useful humorous device, particularly when advertising embarrassing subject matter such as sexually transmitted infection, is the double entendre. A double entendre is a form of pun, which means that it can be understood in two different ways: "an innocuous, straightforward way, given the context, and a risqué way that indirectly alludes to a different, indecent context" (Kiddon & Brun, 2011, p. 89). The fact that double entendres work on different levels, and contain an element of unexpectedness, means that they are a useful tool in advertising, where they have been shown to attract attention (Abass, 2007) and resonate with viewers (Djafarova, 2008). The fact that double entendres allow people to talk indirectly about sex whilst appearing to talk about something completely different makes them an ideal tool for use in advertising campaigns focusing on sexual health.

Humorous double entendres are likely to be even more effective if they are used in combination with metaphor. Metaphor serves as a bridge, transferring features or meanings associated with one entity to another unrelated entity, highlighting associations between them which reveal features that have previously been hidden or have gone unnoticed (Pérez-Sobrino, 2017). While metaphor is frequently used in advertising to highlight desirable features of a product or service (Forceville, 1996; Pérez-Sobrino, 2017; Pérez-Sobrino, 2016b), it can also be used by advertisers to foreground serious topics (Pérez-Sobrino, 2016a) or make indirect claims about what is being advertised (McQuarrie & Phillips, 2005). Moreover, like humorous double entendres, metaphors have been shown to mitigate the impact of explicit content by presenting it in an indirect way (Henley & Donovan, 1999; Pérez Sobrino, 2017).

Like double entendres, when metaphors are used creatively, they involve a degree of incongruity between different entities, contrasting what is expected with what is expressed and bringing about an element of surprise. Resolving this incongruity can lead to a heightened sense of reward in the viewer, and this has been shown to make people particularly likely to appreciate and remember campaigns containing metaphor (Littlemore & Pérez-Sobrino, 2017; Van Mulken, Le Pair, & Forceville, 2010).

But what exactly do we mean by creativity here? For an idea to be considered "creative", it must be both original and effective (Runco & Jaeger, 2012) and combine novelty with appropriateness (Carter, 2004). There are therefore certain "rules" governing the creative process which prevent random, meaningless combinations of ideas from being labeled as "creative". Linguistic creativity often involves some kind of "language play" (Cook, 2000). This might entail drawing attention to possible double meanings of certain words and expressions. This kind of creativity is involved when double entendres are produced. Creativity can also involve "novel analogies or combinations between conceptual elements which have been previously unassociated" (Carter, 2004, p. 47). This kind of creativity is involved in the creation of a new (or "creative") metaphor.

As well as involving completely new mappings and therefore being intrinsically novel, metaphor can also be *used* in creative ways. These include, for example, extending a conventional metaphor in a novel way, using a conventional metaphor in combination with other conventional metaphors or metonyms in a novel way, or making use of dramatic contrast (see Fuoli, Littlemore, & Turner, 2021 for a more extended discussion of the different ways in which metaphor can be used creatively). The fact that creative, humorous double entendres and metaphors have both been found to be effective tools in advertising, particularly when sensitive or taboo topics are involved, suggests that

a combination of the two will be a powerful and effective way of advertising services related to sexual health.

In this paper we present the findings from a study which explored the effectiveness of different formulations of creative, humorous double entendres, some of which contained creative metaphors, in the context of a sexual health awareness-raising campaign. The study was conducted in collaboration with a marketing agency (Big Cat Agency)[1] and a regional nonprofit public sexual health service based in Birmingham, UK (Umbrella Health).[2] Umbrella Health is a UK National Health Service (NHS) Trust that runs sexual health clinics across Birmingham and Solihull in the UK, and distributes kits which test for sexually transmitted infections (STIs). Umbrella and Big Cat were developing a campaign to improve awareness of sexual health, and to increase the number of STI testing kits that people ordered. The ultimate aim was to reduce the spread of STIs in the region.

For the campaign Big Cat had created a number of poster advertisements, each containing a creative, humorous double entendre that made reference to a place in Birmingham or Solihull. In the campaign, some of these double entendres also worked with metaphor, either by comparing two unrelated entities (a Birmingham landmark and a sexual referent), or by resulting in a metaphorical reference to a sexual activity, in order to highlight the campaign message about sexual health. In each case, the meaning could be twisted to refer to a way of contracting an STI. An example of one of the posters is shown in Figure 1. A table showing all of the posters that were developed for this campaign, along with explanations of their geographical referents and double entendre senses is provided in Section 3 below.

"Queensway Tunnel" is a road tunnel that runs through the center of Birmingham. However, here the fact that it is referred to in the context of a sexual health awareness-raising campaign means that it acquires a new meaning, where it refers instead to a woman's vagina. The double entendre here lies in the fact that "Queensway tunnel" refers both to a place in Birmingham and to a sensitive, slightly risqué topic. The metaphor lies in the visual comparison between a tunnel and a vagina, and in the relational comparison whereby both can be "entered". Advertisements where the double entendre resulted in a metaphorical reference to a sexual activity included one which involved a pun on the place name "Sparkbrook", which was reformulated into the question: "Got a spark with Brook?", which means "Do you find Brook (sexually) attractive?" Here the word "spark" is used metaphorically, but there is no metaphorical comparison with the place. This is a conventional metaphorical expression, but in some cases, the resulting metaphorical expressions were creative. For example, in another advertisement, the independent shopping and business workplace known as "The Custard Factory" was reformulated into the question: "Having Fun with his Custard Factory", which refers to the idea of playing with a man's genitalia. This is a completely novel metaphorical expression, which does not exist in everyday English. Thus in this campaign, we can see two kinds of creativity: creative word play (in the double entendres) and creative metaphor. All of the advertisements in the campaign that we worked on involved a creative double entendre, and some contained a creative metaphorical expression.

The aim of our study was to investigate different factors that may impact upon the effectiveness of these double-entendre-based advertisements. Specifically, we investigated whether the effectiveness of the advertisements varied according to (1) whether or not the grammatical formulation cued the intended meaning; (2) whether or not the double entendre involved a creative metaphorical expression; and (3) whether or not the double entendre referred to the beginning, the middle, or the end of the sexual scenario. More detailed explanations of these three ways in which the formulation of the double entendre was varied, and our reasons for selecting them, are provided in the following section. The concept of "effectiveness" was broken down into six areas ("humor", "appeal", "intention to seek further information", "intention to read on social media", "intention to like/comment/share", and "intention to tag a friend"). These variables, and our reasons for selecting them, are explained in more

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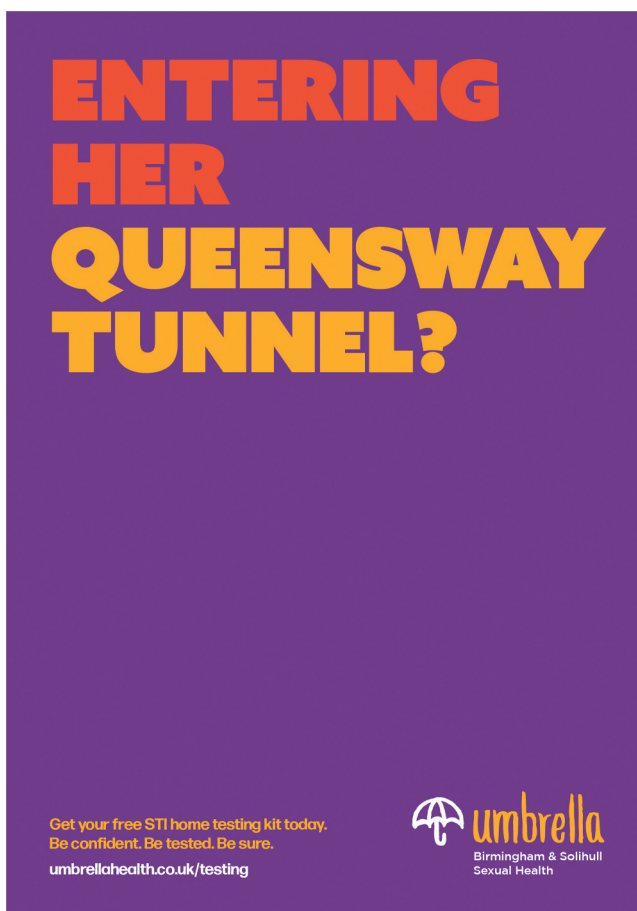
Figure 1. An example of an advertisement containing a figurative double entendre. © Umbrella Health Trust. Reuse not permitted.

detail below. In addition to comparing the effectiveness of the different formulations, we also examined the impact of the age, gender, and level of education of the participants on their responses to these formulations. This is because Umbrella Health was interested in exploring the potential impact of the campaign on these different demographic groups.

Research questions and hypotheses

The two research questions underpinning this study were:

(1) To what extent do different formulations of double entendres in the context of a sexual health awareness-raising campaign influence people's attitudinal and behavioral responses?
(2) Do these findings vary according to the gender, age, and level of education of the participants?

In order to investigate the first question, we varied the formulation of the double entendres in three ways. Our first type of variation involved the grammatical formulation of the double entendre. Examples of this type of variation are shown in Figure 2. In some of the advertisements the name of a landmark in the UK city of Birmingham was used without inserting any additional words. For example, there is a shopping center in Solihull called "Touchwood". As we can see in Figure 2, one of the advertisements made this into a double entendre: "Going to Touch Wood?", which serves as an

Figure 2. An advertisement containing the landmark without word insertion (a) and an advertisement containing the landmark with word insertion (b). © Umbrella Health Trust. Reuse not permitted.

innuendo for engaging in non-penetrative foreplay or sex with a man's penis. In other advertisements the name of the landmark was split up by inserting additional words, in order to cue the intended meaning in a more explicit way. As we can see in Figure 2, for example, "Sparkbrook" (as we saw above) is a place in Birmingham, but this advertisement split the name into two and inserted a word to make the question: "Got a spark with Brook?", which, as we discussed above, suggests that someone may be contemplating a romantic (or sexual) relationship with a woman called Brook.

We expected that advertisements where the landmark appeared without word insertion would be more positively evaluated because viewers have to do more work to determine the sex- or STI-related meaning. On the first viewing they may simply see the name of the landmark, and then there is likely to be a moment of sudden insight when they see the double meaning. Feelings of sudden insight in creative contexts such as this have been found to be a source of pleasure (Kounios & Beeman, 2015). In contrast, when they see the word insertion formulation, the work has already been done for them; the word insertion formulation cues an interpretation that is closer to the intended sexual meaning and is therefore potentially less rewarding.

In our second type of variation, we compared double entendres that contained a creative metaphorical expression with those that did not. As we saw above, double entendres are puns that may lend themselves to a risqué interpretation. Research shows that puns that have an additional creative meaning elicit higher appeal than puns that only one relevant conventional meaning (Van Mulken et al., 2010; Van Mulken, Van Enschot-van Dijk, & Hoeken, 2005). As we saw above, creative metaphors cue novel yet meaningful comparisons between entities, and can have multiple relevant interpretations. People feel a sense of reward when they "get" the meaning and thus find them more appealing (Littlemore, 2019; McQuarrie & Phillips, 2005; Pérez-Sobrino, Littlemore, & Houghton, 2019; Van Mulken et al., 2010). Therefore, we expected that double entendres that resulted in

a creative metaphorical expression would be more positively evaluated than double entendres that resulted in a more conventional expression.

Examples of advertisements that fall into each of these categories are shown in Figure 3. The Custard Factory (as we saw above) and Digbeth are both well-known places in Birmingham. On the left, as discussed above, the creative metaphorical expression being used to refer to sex-related activity: "Having fun with his custard factory?" is being used to refer to sex-related activity. The meaning of this expression can be understood in context, but it is by no means a widely used expression in English. On the right, we have an example of a conventional expression "Dig Beth?". "To *dig* someone" is a conventional (though somewhat old fashioned) expression in English, meaning "to be attracted to someone".

In our third type of variation, we compared advertisements where the double entendres referred to the beginning, the middle, or the end of a sexual scenario in which an STI might be contracted. Examples of advertisements that fall into each of these categories are shown in Figure 4. Advertisement (a) on the left features a double entendre that makes reference to the initial stages of a sexual relationship, where one person finds another sexually attractive: "Got a spark with Brook?". Advertisement (b) makes reference to the "central" part of a sexual scenario where partners are engaging in the sexual act: "Exploring their botanical gardens?". Advertisement (c) on the right features a double entendre that refers to the end of the scenario, where one has contracted an STI: "Is your acocks green?" Sparkbrook, the Botanical Gardens, and Acocks Green are all places in Birmingham.

Here, we hypothesized that double entendres referring to the middle of the sexual scenario would be more effective than those referring to the beginning or end of the scenario. One reason for this is

Figure 3. An advertisement that contains a double entendre resulting in a creative metaphorical expression (a) and an advertisement that contains a double entendre that did not result in a creative metaphorical expression (b). © Umbrella Health Trust. Reuse not permitted.

Figure 4. Examples of advertisements referring to different stages of the sexual scenario. © Umbrella Health Trust. Reuse not permitted.

that the middle of the scenario involves "action". Studies have shown that references to physical action have a stronger effect on the reader because they can activate the sensorimotor cortex, allowing the reader to create a mental simulation of the action (Cacciari et al., 2011; Citron & Goldberg, 2014; Citron & Zervos, 2018; Gallagher, 2008; Gallese & Lakoff, 2005; Matlock, 2006). This enables the reader to relate to the stimulus and empathize with its meaning. In light of this, one might hypothesize that viewers would find the middle part of the scenario more appealing.

Another reason why we anticipated that the advertisements referring to the middle of the scenario would be more effective relates to the Optimal Innovation Hypothesis (Giora et al., 2004). According to this hypothesis, when people are asked to interpret creative uses of language, they prefer it when an optimal amount of work is required to reach the relevant meaning: not too much so as to be too complex, and not too little so as to be too easy to decipher. At the beginning of the scenario, the viewer needs to process the rest of the scenario in order to understand its relation to STIs. At the end of the scenario, the STI symptoms are revealed and most of the work required to reach the intended meaning has already been done. Therefore, in the central scenario there is likely to be an optimal amount of work involved in working out the intended meaning.

In order to answer our second research question, which focused on differences between the participants, we included a balanced sample of participants in terms of age, gender, and level of education. We studied these variables as a main effect in their own right, and in interaction with the three ways of varying the formulation that were described above.

We explored our research questions both quantitatively and qualitatively. That is, in addition to asking our participants to rate the advertisements according to appeal, humor, and intended engagement, we also asked them to write down their interpretations of the advertisements. We identified and analyzed key semantic fields in the interpretations using corpus software in order to establish whether they varied according to the nature of the advertisement and/or according to the characteristics of the participants. To sum up, here are our two research questions again, this time with the three specific hypotheses that we tested in Research Question 1:

(1) To what extent do different formulations of double entendres in the context of a sexual health awareness-raising campaign influence people's attitudinal and behavioral responses?

   H1 Double entendres that have additional words inserted into the original place name will be less effective than ones that do not

  H2 Double entendres that contain creative metaphorical expressions will be more effective than ones that do not

  H3 Double entendres that refer to the middle ("active") part of the sexual scenario will be more effective than ones that refer to the beginning or end of the scenario

(2) Do these findings vary according to the gender, age, and level of education of the participants?

Methodology[3]

To test our hypotheses we developed a cross-sectional, repeated-measures online survey in collaboration with both Big Cat Marketing Agency and Umbrella Health. The survey was designed to facilitate the further development of advertisements for use in the sexual health campaign.

Survey design

The survey was designed using Qualtrics.[4] Participants were shown the same twelve advertisements and asked to respond to a number of questions after each advertisement was displayed. Advertisements were presented in a random order to counterbalance fatigue effects (Savage & Waldman, 2008), primary and recency effects (Miller & Campbell, 1959), and practice effects. Information about the participants' age, gender, and level of education was also collected.

  The twelve advertisements varied in terms of how the double entendres were formulated in the three ways outlined above, namely: (1) with and without word insertion; (2) with and without a creative metaphorical expression; and (3) whether they referred to the beginning, middle, or end of the sexual scenario. The same twelve advertisements were used to test all three variables, which means that each of the individual advertisements was involved in testing all three hypotheses. We acknowledge that the quasi–experimental design of our study is somewhat problematic as it contains confounds. However, the fact that we were conducting this study in collaboration with a marketing agency and their client, using real place names, meant that it was necessary to reach a compromise between the need for experimental rigor and the requirements of our collaborators. Furthermore, ecological validity was a key consideration in the study. There are a limited number of place names in Birmingham and the surrounding area that lend themselves to the kind of double entendres that were deemed appropriate for this campaign. If we were to use a different set of posters to test each of our hypotheses, this would have required at least 36 place names to have been found, which would not have been possible without compromising the variables investigated. Another approach to the study might have involved manipulating a smaller number of posters in different ways so that the other variables under investigation remained constant. However, the adoption of such an approach would have led to a significant reduction in ecological validity as it would have resulted in expressions that do not sound natural in English. The study was designed to be as rigorous as possible within the given constraints, and was developed with the following categorical Independent Variables (IVs).

Independent variables

To develop the first independent variable (IV1), the grammatical formulation of the headlines for each advertisement was coded as either "without word insertion" or "with word insertion". "Without word insertion" headlines used landmarks (e.g. "Touchwood" was presented as "Touch Wood") with no new words inserted splitting up the landmark. "With word insertion" headlines split up the landmark with extra words in order to cue the intended meaning more directly (e.g. "Sparkbrook" was changed into "Spark with Brook").

  The second independent variable (IV2) was formed by categorizing the advertisements according to whether there was a creative metaphorical expression in the intended meaning. We coded an

advertisement as containing a creative metaphorical expression if the resulting expression combined concepts in a new way, or if it gave a new interpretation to an existing metaphorical expression. For example, the headline "Popping in his Mailbox" (which refers both to a shopping center known as "The Mailbox" and to male sexual penetration) was coded as containing a creative metaphorical expression because "popping in his mailbox" is not a commonly used expression in English. We coded "Touch Wood" as not containing a creative metaphorical expression because "touch wood" is a common expression, which is used to refer to masturbation.

The third independent variable (IV3) required the categorization of each advertisement according to the part of the sexual scenario to which they referred. Here we coded them into three categories: (1) "beginning", referring to a sexual interest in someone (e.g. "Dig Beth?"; to "dig" someone means "to be attracted to them"); (2) "middle", referring to a sexual activity during which an STI could be contracted (e.g. "Exploring their Botanical Gardens?" is a metaphor for sexual activity involving the groin region); and (3) "end", referring to the point at which STI symptoms begin to show (e.g. "Is your Acocks Green?"). A summary of how we coded these advertisements is shown in Table 1.

Dependent variables

Six dependent variables (DVs) were created to assess the effectiveness of the three independent variables. We first asked participants to rate each advertisement on a scale from 1–5 according to (1) how humorous they found it to be, (2) how appealing they found it to be, and (3) whether they would seek further information from Umbrella after having seen the advertisement. We then asked three separate questions regarding the extent to which they would engage with the campaign on social media, drawing on the framework proposed by Leek, Houghton, and Canning (2019, p. 118) as guidance. This involved asking them to rate on a scale from 1-5 the extent to which they would: (1) view/read the advertisement on social media, (2) like, comment or share the advertisement, and (3) tag a friend in the advertisement online. These questions were designed to provide an insight into how the double entendres used in the advertisements affected the participants' attitudes and intentional behavior regarding the campaign.

A seventh response was collected using an open-ended textbox to collect participants' interpretations of each advertisement. In this box, they were asked to write their answer to the question: "What do you think the writing at the top of the advert means, and how do you think it relates to the service that is being provided?". The responses to this question were later used for a corpus-based analysis of participants' understanding of the advertisements. In order to control for prior knowledge, we also asked participants to rate the extent to which they were familiar with Umbrella Health.

Participants and procedure

The survey was distributed to participants across the West Midlands (the region in the UK where Birmingham is located) via Prolific,[5] a participant recruitment tool offering an ethical honorarium for participation time (Palan & Schitter, 2018). Each participant received £6.00 per hour, pro-rata, for completion of the survey. A total of 376 participants were recruited. Of these, 21 were excluded from the analysis. The reason for this is that five participants had provided incomplete responses, 13 had not indicated that they were currently resident in Birmingham or the West Midlands, two had noted that their gender was non-binary and one had recorded that they did not identify with a specific gender. Although we were reluctant to exclude these last three participants from the analysis, one of our main research questions concerned the impact of gender on the response patterns, and the non-binary sample was insufficiently large for us to include in the statistical tests. This left 355 participants, of whom 179 were male and 176 were female. Age and education are reported in Tables 2 and 3, respectively.

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[5]Prolific: www.prolific.co.

Table 1. Advertisements coded according to the three formulations.

Birmingham landmarks	Description	Headline	Meaning of double entendre	Grammatical Formulation (IV1)	Creative Metaphor (IV2)	Part of sexual scenario being referred to (IV3)
Touchwood	Shopping center	*GOING TO TOUCH WOOD?*	Engaging in non–penetrative forepay with a man's penis	Without word insertion	No	Middle
Acocks Green	Area of southeast Birmingham	*IS YOUR ACOCKS GREEN?*	Is your penis green because you have contracted an STI?	Without word insertion	No	End
Digbeth	District in central Birmingham	*DIG BETH?*	Are you attracted to Beth?	Without word insertion	No	Beginning
Handsworth	Area of northwest of Birmingham	*COPPING A HANDS WORTH?*	Are you holding someone's breasts, penis, etc.?	Without word insertion	No	Middle
Botanical Gardens	Public gardens situated in Edgbaston, Birmingham	*EXPLORING THEIR BOTANICAL GARDENS?*	Are you touching someone's groin?	Without word insertion	Yes	Middle
Mailbox	Shopping center and business offices (housed in the former headquarters of the post office)	*POPPING IN HIS MAILBOX?*	Are you having anal sex with him?	Without word insertion	Yes	Middle
Custard Factory	Independent shopping and business workspace	*HAVING SOME FUN WITH HIS CUSTARD FACTORY?*	Are you playing with his genitalia?	Without word insertion	Yes	Middle
Queensway Tunnel	Queensway tunnel is part of the A38 road that runs through central Birmingham	*ENTERING HER QUEENSWAY TUNNEL?*	Are you having vaginal sex with her?	Without word insertion	Yes	Middle
Sparkbrook	Area in southeast Birmingham	*GOT A SPARK WITH BROOK?*	Might you be starting to have a relationship with Brook?	With word insertion	No	Beginning
Sarehole Mill	Restored 18th Century working mill in Birmingham	*SAREHOLE BEEN THROUGH THE MILL?*	Is your bodily orifice damaged as a result of having contracted an STI?	With word insertion	No	End
Castle Vale	Housing estate in northeast Birmingham	*HIDING YOUR CASTLE UNDER A VALE?*	Are you hiding your pubic region because it is not well and is therefore unsightly?	With word insertion	Yes	End
Great Barr	Area in northwest Birmingham	*IS YOUR BARR NOT SO GREAT?*	Is your penis not well?	With word insertion	No	End

Table 2. Participant age in years and percentage of sample.

Age	Frequency	Percentage
18–25	77	21.7
26–35	100	28.2
36-50	115	32.4
51+	63	17.7
TOTAL	355	100.0

Table 3. Participant level of educational attainment and percentage of sample.

Education	Frequency	Percentage
No formal education	2	0.6
GCSE/O Level (or equivalent)	63	17.7
A-Level (or equivalent)	125	35.2
Undergraduate (or equivalent)	114	32.1
Postgraduate (or equivalent)	51	14.4
TOTAL	355	100.0

Participants were asked to indicate which age group they were in but not their actual age. The age ranges were chosen to reflect Umbrella's specific targets in their market research. They were also a client requirement; Umbrella Health was seeing an increasing number of people over the age of 50 contracting STIs. They hypothesized that this was a result of people in this age group becoming more sexually active, following a divorce or the death of their spouse, and they were worried that many people in this age group were living without the knowledge of having contracted an STI, and, as a consequence, were spreading infection(s). Umbrella were therefore looking for a campaign that would be effective for this (undifferentiated) age group. They were also worried that asking the participants for their actual age may be off-putting. For these reasons, participants were asked to indicate to which age group they belonged but not their precise age, meaning that we were unable to record specific ages of participants; we acknowledge this as a limitation of the study. The fact that we were collaborating with both the client (Umbrella Health) and the marketing agency (Big Cat Agency) meant that their needs had to be taken into account when designing the study.

The sample reported a low mean score for brand familiarity ($M = 1.4$, $SD = 0.889$). This indicates that participants were mostly "not familiar at all" with the Umbrella Health brand. Therefore, participants' responses and intention to use the service were, for the most part, not based on the brand's reputation or status in the West Midlands area but on their consideration of the information provided in the advertisements that they were asked to view in our study.

Analytical procedures

In order to establish whether the different formulations affected the perceived effectiveness of the advertisements, we conducted three repeated general linear models (ANOVAs) for each independent variable (grammatical formulation, presence of creative metaphorical expression, and part of sexual scenario being referred to) with each dependent variable (humor, appeal, intention to seek more information, intention to view/read on social media, intention to like/comment/share on social media, intention to tag a friend on social media). The variables age, gender, and education were entered as covariates and examined for both main effects and interaction effects with the three independent variables.[6] A Bonferroni correction was applied to reduce the likelihood of making a type I error (i.e. a false rejection of the null hypothesis) resulting from our use of the same data in all three models. Therefore, acceptable significance values are those where $p \leq .017$ ($p \leq .05/3$).[7]

A qualitative analysis of the free-text responses was conducted in order to provide additional insights into the reasoning behind participants' quantitative ratings, and to establish whether the types of interpretations offered by the participants varied according to their age, gender, and level of education. We used AntConc corpus analysis software (Anthony, 2019) to explore word frequencies, keywords, and collocations. Wmatrix's semantic tagging function was used (Rayson, 2008, 2009) to identify the key semantic domains to which the participants referred in their interpretations of the advertisements. We identified and analyzed the key words (and their collocations) and the key

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[6]Where tests violated the assumption of sphericity, the Greenhouse-Geisser correction was applied (see Field, 2007). Otherwise, we report when Sphericity Assumed values.

[7]Mauchly's Test of Sphericity was significant for the main effects of the six independent variables; therefore we henceforth report the Sphericity Assumed values.

semantic domains that characterized the participants' responses to the different formulations of the advertisements, and the responses that were provided by participants grouped by age, gender, and level of education.

AntConc assumes that the observations within corpus data are independent. However, in our data, some of the participants made repeated use of the same expression; for example, by saying that they "don't understand" when commenting on more than one advertisement. This means that the distribution of response types across the different participants were somewhat uneven, leading to issues relating to dispersion (Gries, 2019). We therefore use our corpus data to guide our interpretation of how participants responded to the advertisements, whilst remaining aware of the limitations of this approach.

We report the log-likelihood (*l*) with a Bonferroni correction (as above) and effect size (Cohen's *d*) for keywords, and the mutual information (MI-score) statistics for keyword collocations that are within a 5-left and 5-right window span. We consider MI-scores greater than 3.0 to indicate that the observed frequency of co-occurrence is greater than that expected by chance (Gries, 2010, p. 12; Hunston, 2002). For the semantic domain analysis, a 99% confidence interval was used with a log-likelihood value of 6.63 or over (Rayson, 2008). Using a 99% confidence interval rather than a 95% confidence interval also helps to account for the over inflation of word occurrences in our sample distribution.

Results

Here we report findings with respect to our main research questions and hypotheses regarding the impact on the effectiveness of the three different ways of varying the formulation of the double entendres. Significant main effects were found for each of the three formulations (IVs) on the DVs (humor, appeal, social media views, social media likes/comments/shares, social media friend tags, and seeking more information). There were no significant main effects of participant age, gender, and education for the models conducted. However, significant interaction effects were observed for IV3 ("reference to different parts of the sexual scenario"), with both age and gender. In order to fully explore the reasons for the quantitative findings, we also present our analyses of the data from the free-text responses.

The presence or absence of word insertion (IV1)

The results showed a significant main effect for presence or absence of word insertion on humor ($F_{(1, 346)} = 23.452$, $p < .001$), appeal ($F_{(1, 346)} = 16.459$, $p < .001$), and likely intention to view or read ($F_{(1, 346)} = 27.691$, $p < .001$), like, comment, or share ($F_{(1, 346)} = 7.211$, $p < .01$), or tag a friend ($F_{(1, 346)} = 9.691$, $p < .01$) in the advertisements on social media, and likely intention to seek more information ($F_{(1, 346)} = 16.127$, $p < .001$). Advertisements without word insertion scored significantly more highly for each DV than advertisements with word insertion. Our first hypothesis was therefore accepted (see Figure 5).

Findings from our corpus-based analysis of the free-text responses suggested that participants found it harder to identify the meaning of the advertisements with word insertion than advertisements without word insertion. They were significantly more likely to say that they were "not sure", had "no idea", or "[did] not understand" the meaning of advertisements with word insertion compared to advertisements without word insertion. Moreover, the semantic domains NEGATIVE (e.g. "no idea"; *N*= 865, *l*= 299.9), UNDERSTANDING (e.g. "I do not understand"; *N*= 157, *l*= 77.53), and NO KNOWLEDGE (e.g. "confused"; *N*= 65, *l*= 53.68) were more likely to appear in the free-text responses to advertisements with word insertion than in the responses to the advertisements without word insertion. Within the semantic domain NEGATIVE, participants also commented that advertisements with word insertion were "not a good attempt at humor" and were "not especially humorous".
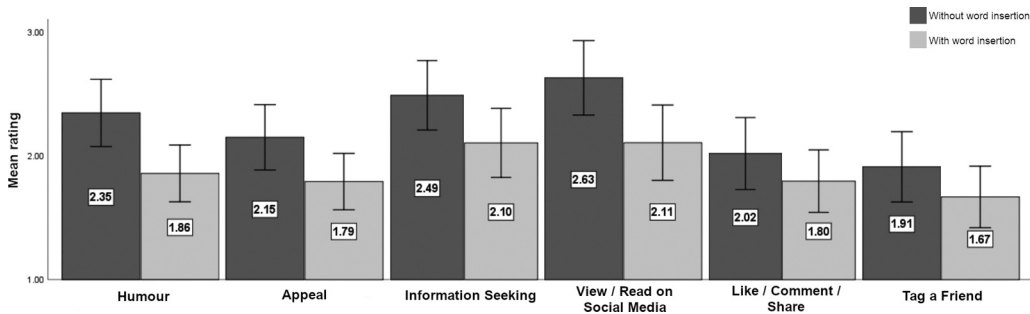
Figure 5. Mean ratings for advertisements without word insertion compared to advertisements with word insertion.

In contrast, participants found it easier to pick out key information in the advertisements without word insertion. For example, they were more likely to mention "STI testing" and "checks" (in EDUCATION: $N= 336$, $l= 13.84$) for the advertisements without word insertion than advertisements with word insertion, in addition to identifying the importance of the "service", "protection", and "help" Umbrella provides. Participants were also more likely to use words relating to humor when talking about the advertisements without word insertion. Key words here included "funny", "joke", "smile", and "humorous" (in HAPPY; $N= 330$, $l= 14.83$).

These findings indicate that the participants preferred the advertisements that did not involve word insertion because they found them easier to understand and funnier. This is interesting as these were the advertisements that did not cue the intended meaning, and one might therefore have expected them to be harder to understand. On the other hand, the fact that the place name was relatively unadulterated in these advertisements makes it clearer that some sort of pun or double reading is intended, and this may have made it clearer to the participants what kind of interpretative work was expected of them.

The presence or absence of a creative metaphorical expression (IV2)

The descriptive statistical data showed an overall trend whereby double entendres that resulted in creative metaphorical expressions for sex-related activities were more positively evaluated than those that did not (see Figure 6). However, the inferential statistical analyses showed that significant main effects could only be found for humor ($F_{(1, 346)} = 5.703$, $p= .017$) and "likely intention to view or read the advertisement" ($F_{(1, 346)} = 7.948$, $p< .01$). No significant main effects were found for appeal, intention to like, comment, or share, or tag a friend in the advertisements online, or seek more information (all $p's> .017$). Therefore, our second hypothesis was only partially accepted.
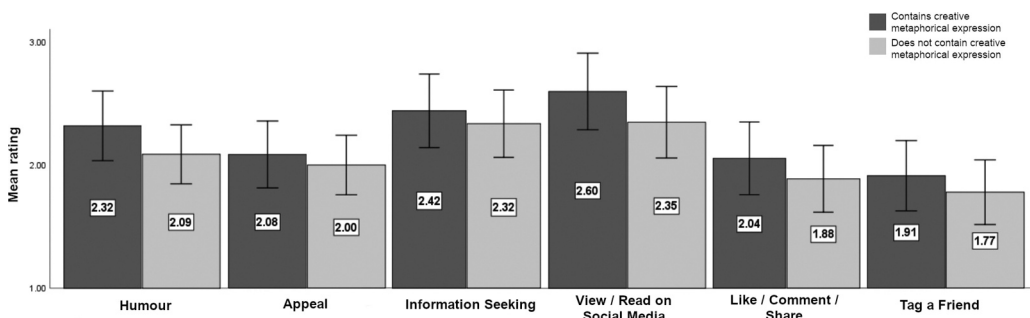

Figure 6. Mean ratings for advertisements with and without a creative metaphorical expression.

In the keyword analysis we observed that, in comparison with the advertisements that contained creative metaphorical expressions, when participants were writing about the advertisements that did not contain a creative metaphorical expression, they were more likely to say that they had not understood the meaning. NEGATIVE ($N= 1094$, $l= 53.8$), UNDERSTANDING ($N= 192$, $l= 19.32$), and NO KNOWLEDGE ($N= 72$, $l= 14.04$) emerged as key semantic domains. Interestingly, this suggests that participants found it easier to understand the advertisements that contained creative metaphorical expressions than ones that did not. This may also relate to their expectations regarding the genre of advertising; people expect to find creativity in this genre and may therefore be surprised or disappointed when it is not there.

Reference to different parts of the sexual scenario (IV3)

We found a significant main effect for the part of the sexual scenario that was being referred to on humor ($F_{(2, 345)} = 5.41$, $p< .01$), appeal ($F_{(2, 345)} = 4.205$, $p= .015$), likely intention to view or read online ($F_{(2, 345)} = 9.696$, $p< .001$), like, comment, or share online ($F_{(2, 345)} = 4.605$, $p< .01$), and tag a friend ($F_{(2, 345)} = 4.238$, $p= .015$), and likely intention to seek more information ($F_{(2, 345)} = 4.462$, $p= .012$). Our examination of within–subjects contrasts (see Figure 7) suggested that advertisements where the double entendre referred to the middle of the scenario scored significantly higher than those where the double entendre referred to the beginning or the end of the scenario for all six measures of effectiveness: humor (middle vs. beginning: $p= .018$[8]; middle vs. end: $p< .001$), appeal (middle vs. end: $p< .001$), likely intention to view or read online (middle vs. beginning: $p< .01$; middle vs. end: $p< .001$), like, comment, or share online (middle vs. end: $p< .001$), and tag a friend (middle vs. end: $p< .01$), and seek more information (middle vs. end: $p< .001$). Thus, our third hypothesis was accepted.

Of the three IVs, only reference to different parts of the sexual scenario (IV3) resulted in significant interaction effects with demographic variables. Effects were observed for IV3 with gender on appeal ($F= 4.647$, $p= <.01$), with age on humor ($F= 3.824$, $p< .001$), with age on likelihood to "like, comment, or share" the advertisement online ($F= 3.114$, $p< .01$), and with age on likelihood to tag a friend in the advertisement online ($F= 3.307$, $p< .01$). We found a significant interaction effect for double entendres referring to the middle compared to the beginning of the sexual scenario with gender on appeal ($F= 7.681$, $p= <.01$). We also found significant interaction effects for age with double entendres referring to the middle of the sexual scenario on humor (middle vs. beginning: $F= 4.327$, $p< .01$; middle vs. end: $F= 4.355$, $p< .01$), for double entendres referring to the beginning of the sexual scenario on "intention to like, comment, or share" advertisements online (beginning vs. end: $F= 3.474$, $p= .016$), for double entendres referring to the beginning of the sexual scenario on likely intention to tag a friend (beginning vs. end: $F= 3.437$, $p= .017$), and for double entendres referring to the middle of the sexual scenario on likely intention to tag a friend (middle vs. end: $F= 3.694$, $p= .012$).
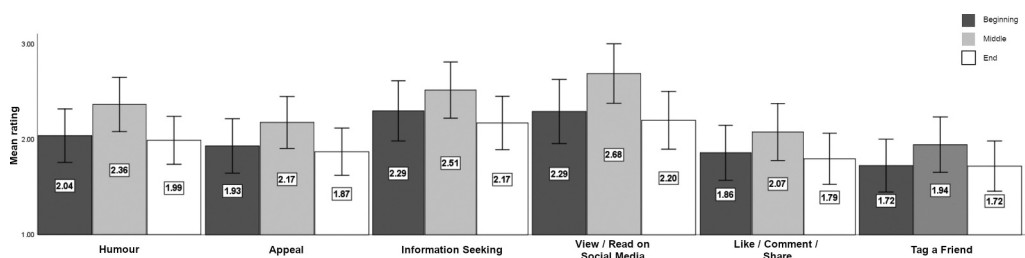

Figure 7. Mean ratings for advertisements where the double entendre referred to the beginning, middle, and end of the sexual scenario.

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[8]While this was not significant according to our Bonferroni correction ($p \leq .017$), it was supported by Pillai's Trace Test ($p = .001$) suggesting that it is highly likely to occur more than chance. Therefore, we consider this result worthy of note.
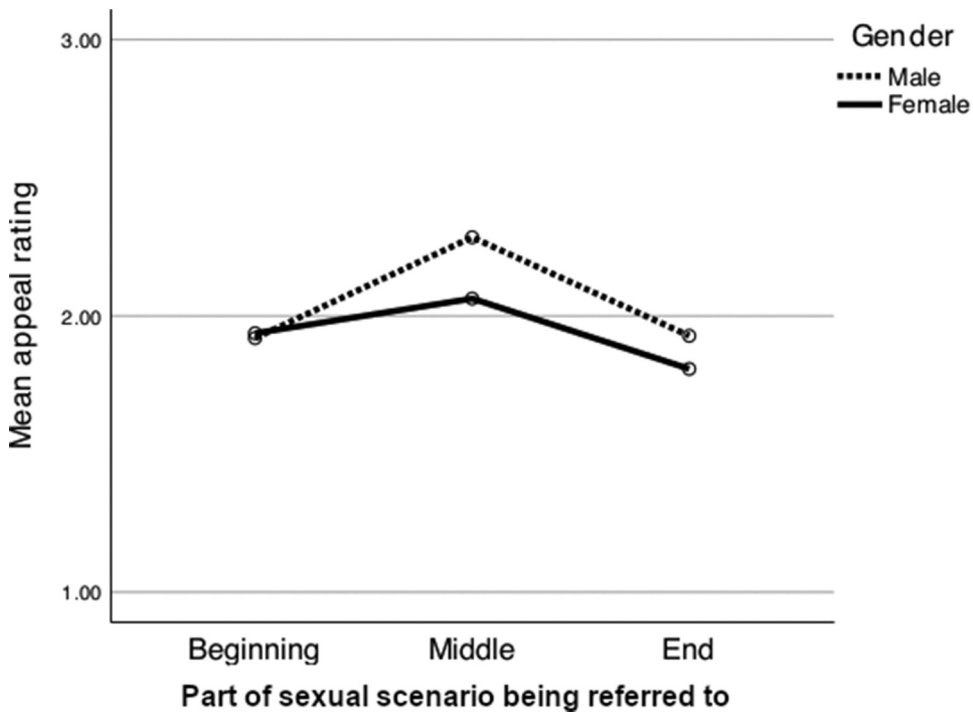
Figure 8. Mean appeal ratings for advertisements referring to the beginning, middle, and end of the sexual scenario, by gender.

In terms of gender, we can see in Figure 8 that the mean scores for appeal were the most disparate between males and females for advertisements that referred to the middle of the sexual scenario, with male participants finding them more appealing than female participants. With reference to age, Figure 9 shows that for advertisements that referred to the middle of the sexual scenario, participants aged 51 or more years were less likely to find the campaign humorous than participants aged 18 to 50 years. Figures 10 and 11 show that the oldest participants (aged 51+ years) were the least likely to like, comment, or share, and tag a friend in the advertisements on social media and, along with participants (18–25 years), were less likely to engage with advertisements online than participants in the two central age groups (26–35 years and 36-50 years), especially when the double entendre referred to the end of the sexual scenario.

Our corpus-based explorations of the free–text responses showed that there were differences in how male and female participants wrote about the advertisements. In comparison with female participants, male participants were more prone to positively evaluate the advertisements (EVALUATION: GOOD: $N= 113$, $l= 14.15$; HAPPY: $N= 245$, $l= 11.12$), noting the use of "double entendre" ($N= 14$, $l= 20.12$, $d= .0011$) with reference to ANATOMY AND PHYSIOLOGY ($N= 482$, $l= 8.46$), using words such as "penis" ($N= 157$), "vagina" ($N= 44$), and "genitals" ($N= 34$). In contrast, female participants commented on there being a STRONG OBLIGATION OR NECESSITY ($N= 168$, $l= 8.80$) to get "tested" ($N= 133$, $l= 46.87$, $d= .0095$) for "protection" ($N= 20$, $l= 20.14$, $d= .0014$). Of the 20 responses mentioning "protection", only two responses framed it as being the man's responsibility to get protection against STIs. For the majority of responses, participants either suggested that it was the woman's responsibility to protect herself ($N= 9$), or talked more generally about the importance of protection during sexual intercourse ($N= 9$). In comparison to female participants, male participants made little mention of the importance of sexual health in their responses.

Participants aged 18–25 years were significantly more vocal than any other age group about there being a STRONG OBLIGATION OR NECCESSITY ($N= 162$, $l= 5.88$) for the individual to get tested
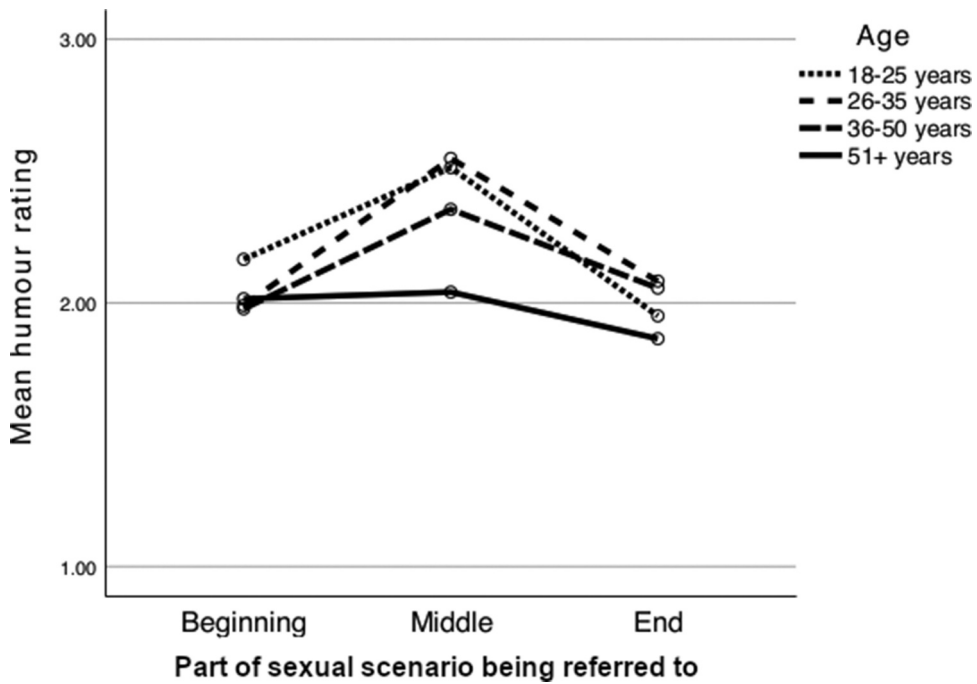
Figure 9. Mean humor ratings for advertisements referring to the beginning, middle, and end of the sexual scenario, by age.
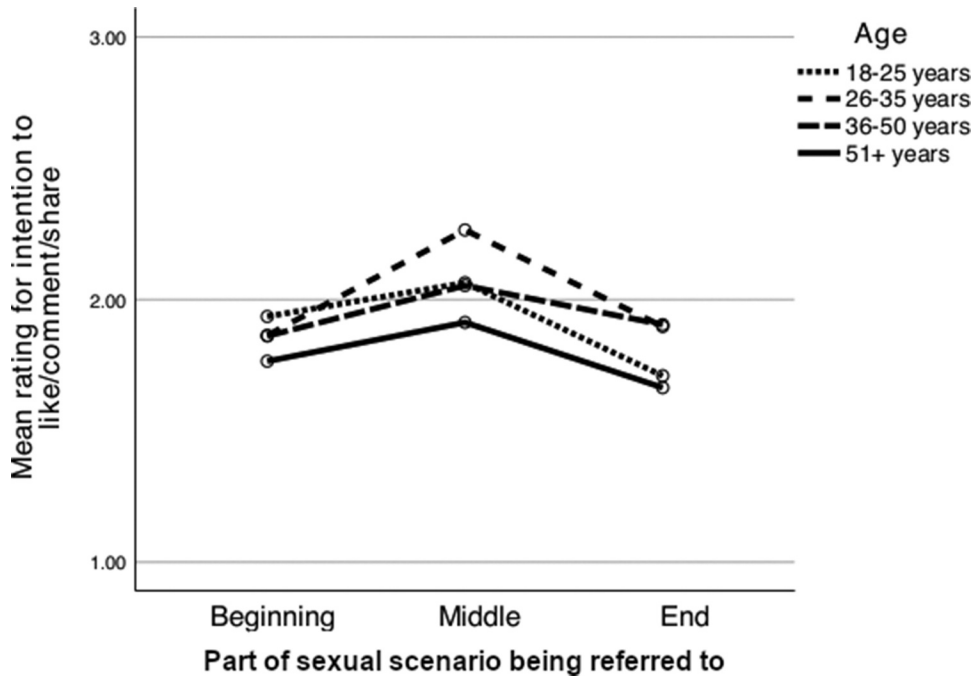

Figure 10. Mean ratings for intention to like, comment, or share the advertisements referring to the beginning, middle, and end of the sexual scenario, by age.

for STIs. We saw in Figures 10 and 11 that participants aged 26-35 years tended to give the advertisements higher scores than the other age groups. These participants were more likely to evaluate the advertisements positively in their free–text responses (HAPPY: $N= 164$, $l= 13.79$;
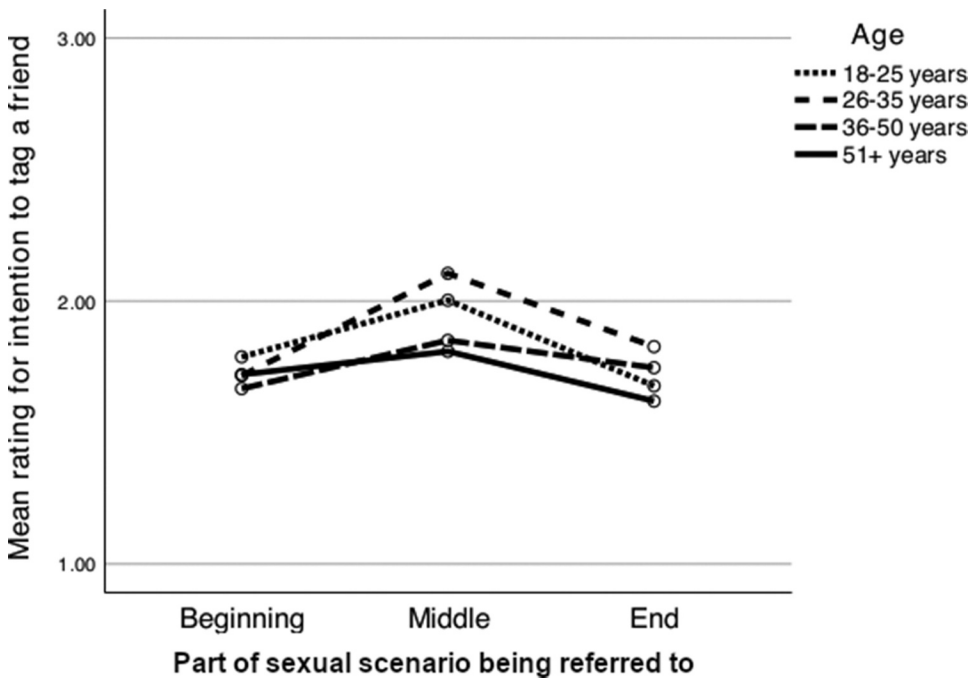
Figure 11. Mean ratings for intention to tag a friend in the advertisements referring to the beginning, middle, and end of the sexual scenario, by age.

GOOD EVALUATION: $N= 10$, $l= 8.00$; EASY: $N= 20$, $l= 8.99$), as they were more likely to recognize the "joke" ($N= 45$, $l= 21.23$, $d= .0055$) as an "innuendo" ($N= 48$, $l= 29.68$, $d= .0059$) that "related" ($N= 51$, $l= 22.85$, $d= .0063$) to sexual health and sexual health services as well as to Birmingham landmarks. The qualitative data showed that health issues and concerns were discussed more by the older participants. For instance, participants aged 36-50 years were more likely to mention specific "clinics" ($N= 24$, $l= 22.9$, $d= .0028$) in Birmingham, and participants aged 51 years and over focused more on what the service advertised "offered" them ($N= 15$, $l= 18.65$, $d= .0034$). Participants in this eldest age group were more likely than participants in the other age groups to make reference to the need for "tests" ($N= 11$, $l= 20.36$, $d= .0025$) in order to prevent or minimize their risk of contracting a sexually transmitted "infection" ($N= 16$, $l= 22.11$, $d= .0036$).

Impact of the campaign

The findings from our study suggested that the advertisements would be more likely to be successful if: (a) they did not have extra words inserted into the original place name, and thus did not cue the intended meaning too explicitly; (b) they contained a creative metaphorical expression referring to a sex-related activity; and (c) they referred to the middle of the sexual scenario, rather than the beginning or the end. We therefore recommended to Big Cat Agency and Umbrella Health that they include more items that met these three criteria in the campaign.

Big Cat acted on our recommendations by including more advertisements in the campaign that satisfied these criteria. The resulting sexual health campaign was launched in June 2019 with great success. It must be noted, however, that while the campaign outcomes were positive, there are likely to have been other factors that contributed to the campaign's success besides the characteristics that were identified in our study. Moreover, the results from one campaign are not enough to conclusively prove the success of the changes that we suggested.

The marketing evidence showed a considerable increase in engagement with this campaign in comparison with previous campaigns. It also showed a strong increase in engagement with Umbrella's services in comparison with that seen in the months prior to the campaign's launch. Outdoor posters had a greater reach than targeted, reaching 655,648 people over the targeted 608,984 (an increase of 7.66% over target). In terms of online social media engagement: Facebook posts increased from 1,495 in 2018 to 64,776 in 2019; advertisement impressions in 2019 were 237,439 with 2,168 clicks, up from 156,706 impressions and 939 clicks in 2018; and Google AdWords impressions increased by 1,000 people in 2019. During the campaign, the website attracted 17,799 users, an increase of 1,000 over the previous STI campaign, with "Appointments" page, the first step to ordering a kit or booking a health check, views increasing by 1,000. The number of STI testing kits ordered from Umbrella increased by 51% (from 3,784 per month to 5,729 per month) over the course of the campaign (April-July 2019). Approximately 10% of the kits tested positive meaning that an additional 778 STIs (including HIV) were diagnosed and treated as a result of the campaign.

Discussion

Overall, the results from our study show that advertisements containing double entendres were significantly more appealing and humorous if: (1) the grammatical formulation did not cue the intended meaning; (2) the double entendre involved a creative metaphorical expression; and (3) the double entendre referred to the middle of the sexual scenario, focusing on action rather than intent or result. Participants' ratings varied very little according to their age, gender, and education. However, a qualitative investigation of the free-text responses revealed that there was marked variation in the types of interpretations that were offered by participants depending on their age, gender, and education.

In our study, we have shown that double entendres can be formulated in different ways, which lead to varying degrees of effectiveness. Variation in formulation can take place at the level of grammar (as we saw in our first type of variation, where we looked at whether the landmark had been split up to cue the intended meaning), semantics (as we saw in our second type of variation, where we compared the effectiveness of advertisements with and without a creative metaphorical expression), or narrative (as we saw in our third type of variation, where we compared the relative benefits of using the double entendre to refer to the beginning, middle, or end of the sexual scenario). We found that of these three ways of varying the formulation, the first and the third exerted the strongest effect, as they affected all six dependent variables. The presence of a creative metaphorical expression affected only two of them.

Our findings add nuance to the general proposition that advertisements that are more creative, or where the viewer has to do more work to reach the intended meaning, or which contain a strong element of surprise are more likely to be effective than advertisements that do not exhibit any of these characteristics. Our findings also provide tentative support for Giora et al.'s (2004) Optimal Innovation Hypothesis. In our third way of varying the formulation, three choices were offered and the choice involving a median or "optimal" amount of interpreting effort was favored, such that participants had to work out some of the sexual scenario themselves, but not too much nor too little. There may be a confound here in that the central part of the scenario was also the most active part, and we saw in Methodology section that metaphors referring to action are more likely to be appreciated than ones that do not. Further research would be required to disentangle these two possibilities.

Two of the findings in this study are somewhat unexpected and are therefore intriguing. In general, the mean scores were rather low on all counts, regardless of the advertisement under consideration, although the marketing evidence shows that the campaign itself was very successful. This suggests that quantitative scores of perceived effectiveness are somewhat limited as a proxy for actual effectiveness. Embedding advertisements in an environment emulating natural exposure (e.g. website mock-up) may provide more ecologically valid measures of perceived effectiveness.

The second interesting and unexpected finding comes from our analysis of the free-text responses provided by participants when answering questions about advertisements with different grammatical

formulations, and advertisements with and without creative metaphorical expressions. These free-text responses appear to suggest that participants found the advertisements in which the landmark appeared with no word insertion easier to interpret than advertisements with word insertion. The participants also appeared to find advertisements that contained creative metaphorical expressions easier to understand than advertisements that did not. These findings run counter to our expectations; we had predicted that the advertisements with word insertion would be easier for participants to interpret because much of the work required to reach the meaning had already been "done" for them. We had also expected advertisements containing creative metaphorical expressions to be more difficult to interpret than advertisements without creative metaphorical expressions. One possible explanation for this relates to the genre of advertising. People may expect to find creativity in this genre, particularly when humor is involved and, to some extent, they may be primed to look out for it. When it does not appear, feelings of perplexity and confusion may ensue as the advertisements are not conforming to genre conventions. This suggests that the genre must be taken into account when conducting research into the ways in which people respond to creative metaphors.

Finally, turning to individual differences, we found an interaction effect for gender, with male participants finding advertisements that referred to the most sexually explicit part of the sexual scenario (the middle) more appealing than females. This finding is in line with previous work showing that men tend to be more comfortable with sexually explicit content in advertisements than women (Eisend, 2018; Pope, Voges, & Brown, 2004; Prendergast & Hwa, 2003). Our qualitative analysis of the free–text responses showed that male participants were more likely to pay attention to the humorous effects, while female participants were more concerned with their perceived obligation and responsibility to get tested as a means of protection against STIs. The emphasis on women being more responsible than men for obtaining protection against STIs in a sexual relationship reflects a traditional view of gender roles.

We also found that younger participants (18-50 years) found the most sexually explicit part of the advertisements more humorous than older participants (51+ years). These results may reflect a generational taboo for talking about sexual activity, whereby the older generation are not as able to talk about sex and may find it more embarrassing and offensive than the younger generations (Myers, Deitz, Huhmann, Jha, & Tatara, 2019). The older participants were the least likely to like, comment, or share, or tag a friend in the advertisements on social media compared with other participants. This might be because the older age group is less likely to be active on, or familiar with, social media, and therefore be less likely than younger participants to engage with the campaign online. How different age groups interact with social media in general will also affect the findings, and requires further research. Older participants also appeared to be more concerned with their health and so took the advertisements more seriously. These findings highlight the fact that in any study of this kind, effectiveness ratings are likely to be shaped by personal experiences and societal expectations. This underscores the extent to which studies of advertising effectiveness are context-sensitive.

The findings from this study appear to suggest that double entendres used in this context are most effective if they contain an element of surprise, if they are optimally innovative, and if they contain a creative metaphorical expression. These findings could usefully be explored further in different contexts, with different populations, and with different genres of advertising.

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Disclosure statement

company that may be affected by the research reported in the enclosed paper. We have disclosed those interests fully to Taylor & Francis and have in place an approved plan for managing any potential conflicts arising from this arrangement. The Umbrella Health Trust has granted permission for us to use the campaign images in this paper.

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Data availability statement

The data and output supporting the results and analyses presented in the paper can be found on the Open Science Framework Repository: https://osf.io/4jsg9/.

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