Humor with backgrounded incongruity: Does more required suspension of disbelief affect humor perception?

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Abstract

Humorous stimuli, like jokes and cartoons, are assumed to contain a central incongruity in a specific constellation of opposition and overlap that is essential to their humorousness. Many stimuli also contain additional incongruities that the audience usually overlooks, but that may be needed to create the setup for the main incongruity, e.g., animals that talk, space aliens, an Italian, an American, and a Russian sharing a language. Two of the studies described in the present paper investigated the effect of such backgrounded incongruities by removing them from a set of jokes and cartoons and testing how this affects humor processing and appreciation. A third study investigated whether the elimination of a backgrounded incongruity influences the position of a humorous stimulus on the incongruity-resolution and nonsense humor continuum. Methods included computer-based stimulus rating and self-explanations by the participants. The results suggested that backgrounded incongruities influence humor appreciation because their elimination leads to lower funniness and higher aversion. Furthermore, the backgrounded incongruities contribute strongly to the perceived absurdity of a joke. When they are removed, the jokes are perceived less to be nonsense humor but more as incongruity-resolution humor.

Keywords: backgrounded incongruity; cognitive; humor; nonsense.

1. Introduction

A joke or cartoon usually has several incongruities, including the one that makes up the main incongruity that is foregrounded by the punchline as well

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as one or more that remain in the background. This distinction of foregrounded and backgrounded "script oppositenesses" is already discussed in detail in Raskin (1985: 132–139). For example, picture the following cartoon[1]:

A dead man is lying on the ground, bleeding profusely, a knife stuck in his back. Next to him stands personified Death in his hooded cloak, holding his scythe. He says: "I knew it. You are a spring type. Red fits you perfectly."

The association between the color of the blood and the type of color season that fits you can be seen as the main incongruity. That Death is a talking character in this cartoon is one of the backgrounded incongruities. What happens when this backgrounded incongruity is eliminated, for example: in the following way?:

A dead man is lying on the ground, bleeding profusely, a knife blade stuck in his back. Next to him stands another man, holding the handle of the broken knife. The second man says: "I knew it. You are a spring type. Red fits you perfectly."

The aim of the present study is to investigate the effect of such backgrounded incongruities on humor processing and appreciation. Along a dimension from a negative to a positive effect on the perceived funniness of a joke or cartoon, a backgrounded incongruity may be assumed to be detrimental for the joke and distract from its main humorousness, or be just accepted as part of the joke world and have no effect, or may even enhance perceived funniness.

The major cautionary note for this type of stimulus manipulation is, of course, that removing a backgrounded incongruity from a cartoon, and even more so a joke, is a very difficult operation that can easily influence the stimulus in more ways than was intended. Just as a simple translation, in particular of nonsensical humor, may not successfully take a joke's or cartoon's textual element's humorous potential from one language to another (Chiaro 2008). The meaning of a text is not built in modular fashion from each word as a building block. So changing even a single word will have multiple effects on the meaning of a text, even more so in highly condensed texts with strong aesthetic components like jokes that are pieces of folklore finely honed through repeated transmission and highly dependent on aesthetic mechanisms in language as well or cartoons that usually are the carefully crafted product of artists (Hempelmann and Samson 2008). This issue has also been highlighted by Ruch:

The empirical test of the validity of the theoretical models is contingent on the variation of the key ingredients (e.g., degree of incongruity, resolution, salience of contents);

however they cannot be varied independently of each other by manipulating a joke or cartoon. For example, making the punch line more incongruous simultaneously means changing its content or other properties. (Ruch 2001: 418)

The experiment reported here is the first to investigate whether the presence of backgrounded incongruities influences the processing (recognition times of the punch line, comprehensibility) and appreciation (funniness) of a humorous stimulus. It is centrally based on the work of Attardo and Hempelmann (this issue) who analyzed three different types of incongruities in humorous texts: completely backgrounded, backgrounded, in the context of "logical mechanisms" of jokes as resolution enablers, which are only found for foregrounded incongruities and always partial, and make the incongruity appropriate only locally and spuriously (Oring 1992, 2003).

This paper is an attempt at empirically verifying a stable effect of that distinction along the lines proposed by Hempelmann and Attardo (this issue): "Thus, a proposal for a way to quantify incongruity and to classify nonsensical jokes could be: Jokes with a backgrounded non-essential incongruity that is not addressed by the Logical Mechanism (and hence unresolved [. . .])." The aim is to examine the effect of the availability of backgrounded incongruities on the intelligibility, perceived funniness, but also on the absurdity, or nonsensicalness, of a joke. As shown by Ruch (1981), the structure of the joke influences the appreciation (funniness but also aversion) of a humorous stimulus to at least the same extent as its content[2]. The structure of the joke can be determined by its incongruity but also by the resolvability of the incongruity (which can be considered the core of humor comprehension). At one extreme of a continuum, incongruity-resolution humor can be positioned, that is, humor that consists of humorous stimuli with a main incongruity that is largely resolvable without leaving many questions open — very little or no residual incongruity remains. Towards the other extreme are humorous stimuli whose incongruity can't be resolved completely or where new incongruities might even emerge so that much residual incongruity (rINC) remains. Such humorous stimuli are perceived to be more grotesque and absurd (Samson and Ruch 2005) and often have of script oppositions that are impossible in contrast to abnormal or actual script oppositions (Hempelmann and Ruch 2005). Recently, Samson et al. (2009) showed that areas involved in the incongruity-resolution process evoked more neural activity during processing of incongruity-resolution jokes than during processing of nonsense jokes, possibly because there is more information to be integrated, more sense to be made than in nonsense jokes.

The present study also aims to investigate whether the manipulation of the backgrounded incongruity changes stimuli properties in such a way that they are more strongly perceived to be incongruity-resolution or nonsense humor, respectively, than their unmanipulated counterparts. Is it possible that cartoons with a backgrounded INC have more rINC than cartoons without backgrounded INC and are more strongly perceived to be nonsensical jokes or cartoons?

The main assumption here is that the presence of a backgrounded incongruity influences humor processing and the appreciation of the stimulus material. To investigate this, three studies were conducted. The first addressed the effect of a backgrounded INC on the intelligibility of jokes and cartoons, on their funniness, and on which incongruities are explicitly mentioned if the participants are asked to describe the stimuli. However, Explanations as to why the participants considered a cartoon to be funny were taken into account in addition to the rating scales to further illuminate cognitive processes (see also McGhee 1971; Loizu 2006; Samson in press). In this context we analyzed which incongruity (backgrounded, foregrounded) participants referred to explicitly. It is expected that the presence of a backgrounded incongruity enhances funniness ratings, particularly if the participants explicitly referred to the backgrounded incongruity. The second experiment was a replication and expansion of the first with improved stimulus selection and manipulation processes (only cartoons). The aim of the third study was to determine whether the elimination of the backgrounded incongruity changes the position of a cartoon on the continuum from incongruity-resolution to nonsense humor.

2. Study 1

2.1. *Method*

2.1.1. *Participants.* Thirty-two participants (age: range from 19 to 47, mean: 25.3 years; 17 males and 15 females) took part in the experiment. They were recruited via advertisements on the blackboard at the University of Fribourg. Thirty of them were students, two of them academics working at the University.

2.1.2. *Stimuli.* Several cartoon and joke books as well as the Internet were searched for humorous stimuli that contained a removable backgrounded incongruity. Twenty verbal jokes and 20 cartoons (some captioned or with speech balloons) were found such that the backgrounded incongruity could be elimi-

nated without substantially changing the main incongruity and its playful resolution, but the introductory cautionary note about stimulus manipulation needs to be reemphasized at this point. They were reconfigured (redrawn or rewritten) into a version without the backgrounded incongruity (see appendix for description of the fore- and backgrounded incongruities of the first study). Six people were involved in the selection and modification process of the stimuli, two of them the authors of this paper, the other four, who were unaware to the hypothesis regarding the elimination of the backgrounded incongruity, are acknowledged in the notes. The two versions of the verbal jokes did not differ significantly in terms of the number of words (without backgrounded incongruity: $M = 77.75$, $SD = 30.40$; with backgrounded incongruity: $M = 78.05$, $SD = 30.75$; $F(1, 39) = .001$, $p = .98$).

Thus, each stimulus existed in a version with and one without backgrounded incongruity, leading to a total of 80 stimuli. Six cartoons and 6 jokes (both versions: with and without backgrounded incongruity) were chosen randomly from the main set of stimuli for the second part of the experiment, in which the participants had to explain the punch line of the stimuli.

2.2. *Design and procedure*

Eighty stimuli plus one warm-up were used in this experiment. The independent variables were stimulus type (20 cartoons and 20 jokes) and backgrounded incongruity (one version with and one without). The dependent variables were recognition time, comprehensibility, and funniness. Furthermore, humor explanations were collected for a total of 12 stimuli (6 cartoons and 6 jokes) in order to investigate which incongruities depending on the versions (with and without backgrounded incongruity) were mentioned by the participants.

Each participant had to rate only one version of a joke or cartoon, either with or without the backgrounded incongruity. Thus, a set of 40 stimuli was rated on the computer screen by each participant for comprehensibility and funniness. Two versions of stimuli sets were created, each presented to half of the participants selected randomly: In one, 10 cartoons and 10 jokes were presented with the backgrounded incongruity, the other 20 stimuli were presented without. In the other stimulus set, the versions were reversed.

The participants were instructed to press a button as soon as they understood the cartoon or joke, and a different button if they didn't understand it. If the participant indicated that they didn't understand the cartoon or joke, the next stimulus appeared after a delay of 1500 milliseconds. Otherwise they had to

indicate how funny the cartoon or joke was on a 6 point scale from not funny at all (1) to very funny (6) before the next cartoon appeared after the same delay. After rating all 40 stimuli, participants were given a break of 5 minutes. Then, 6 cartoons and 6 jokes in the same version as already presented, either with or without backgrounded incongruity, were shown to the participants individually on paper sheets. They were instructed to write down how they understood the stimuli and indicate what aspects they found to be funny. They were also asked to indicate whether they understood the punchline or not. The whole procedure took about thirty minutes.

2.3. *Results*

Table 1 reports means and standard deviations for the stimuli with and without backgrounded incongruity for comprehensibility, recognition times, and funniness. As comprehensibility and reaction time did not meet the requirements of a normal distribution for the analyses of variances, we computed Wilcoxon signed-rank tests for these two variables.

2.3.1. *Comprehensibility.* A Wilcoxon signed-rank test revealed no differences between jokes and cartoons in comprehensibility, but a tendency that stimuli with backgrounded incongruity were more easily understandable than those without backgrounded incongruity ($z = -1.81$, $p = .07$). In cartoons no significant difference was found, but jokes with backgrounded incongruity were significantly better comprehensible than those with eliminated backgrounded incongruity ($z = -2.01$, $p < .05$).

Table 1. *Means and standard deviations of comprehensibility, recognition time, and funniness ratings for cartoons and jokes with and without backgrounded incongruity.*

	with backgrounded INC		without backgrounded INC	
	cartoons *M (SD)*	jokes *M (SD)*	cartoons *M (SD)*	jokes *M (SD)*
comprehensibility	.92 (.10)	.94 (.10)	.89 (.10)	.89 (.13)
recognition time (s)	11.81 (6.48)	23.55 (10.98)	12.78 (6.44)	28.33 (13.80)
funniness	3.81 (.66)	3.42 (.84)	3.32 (.79)	3.06 (.80)

Notes: N = 32. Only the humorous stimuli that were understood are taken into account for recognition time and funniness. Comprehensibility: 0 = not understood, 1 = understood; funniness from 1 = not funny at all to 6 = very funny.

2.3.2. *Recognition time.* Only the humorous stimuli that were understood entered this analysis. A Wilcoxon signed-rank test revealed that jokes took more time to be processed than cartoons ($z = -4.94$, $p < .001$), possibly due to reading times. For the calculation of jokes and cartoons combined, stimuli with eliminated backgrounded incongruity took longer to be understood than with backgrounded incongruity ($z = -3.48$, $p < .001$). In cartoons, there was no significant effect between stimuli with and without backgrounded incongruity, but jokes with backgrounded incongruity took less time than without backgrounded incongruity ($z = -2.75$, $p < .01$) to process. This might indicate that jokes without backgrounded incongruity are more difficult to understand. It might also be possible that the modification of verbal jokes was less successful than that of the cartoons, given the higher density, or lower iconicity, in verbal symbols than in visual ones (cf. Hempelmann and Samson 2007).

2.3.3. *Funniness ratings.* Only the humorous stimuli that were understood entered the analysis. A 2 x 2 repeated measures ANOVA with two within-subject variables (cartoons vs. jokes and with or without backgrounded incongruity) showed a significant effect for the presence of backgrounded incongruity ($F[1, 31] = 15.62$, $p < .001$) and a weaker effect for the stimulus differences (cartoons vs. jokes: $F[1, 31] = 7.00$, $p < .05$). Furthermore, the interaction was not significant. This shows that cartoons were rated to be funnier than jokes, as well as that humorous stimuli with a backgrounded incongruity were funnier than humorous stimuli with eliminated backgrounded incongruity (see Table 1).

2.3.4. *Explanations.* In the next step we were interested in the explanations people provide for why they think a joke is funny. The question was which type of incongruity the participants referred to: foregrounded incongruity, backgrounded incongruity, or an additional incongruity. Each participant provided explanations for why they thought a cartoon was funny for a total of 12 stimuli, six with and six without backgrounded incongruity. The number of mentioned foregrounded, backgrounded, or additional incongruities was counted. One rater coded blindly whether a participant mentioned an incongruity, which had been identified as backgrounded or foregrounded beforehand (see appendix) and whether additional incongruities were mentioned.

Interrater reliability: 25% of the explanations were randomly selected and coded by a second rater for the mentioning of the foregrounded, backgrounded, and additional incongruities. Summaries of the mentioned incongruities were created for each participant and each coder and were correlated. Interrater

reliability was satisfactorily high for the foregrounded incongruities ($r = .92$, $p < .01$), for the backgrounded incongruities ($r = .99$, $p < .001$), and for the additional incongruities ($r = .92$, $p < .001$). Therefore, the codings by the first rater were usable for further statistical analysis.

Paired sample t-tests showed that there was no difference in the mentioned foregrounded incongruities in relation to the availability of a backgrounded incongruity (stimuli with backgrounded incongruity: $M = 4.41$, $SD = 1.29$, without backgrounded incongruity: $M = 4.78$, $SD = 1.24$). Not surprisingly, the backgrounded incongruity was mentioned only in the versions of the stimuli where it wasn't removed ($M = 2.44$, $SD = 1.16$)[3]. Interestingly, in humorous stimuli without backgrounded incongruities ($M = 2.41$, $SD = 1.36$) significantly more additional incongruities were mentioned than in stimuli with backgrounded incongruity ($M = 1.66$, $SD = 1.38$, $t[31] = 2.95$, $p < .01$).

2.4. *Discussion*

This study showed that humorous stimuli, i.e., jokes and cartoons, are processed faster and considered funnier when the backgrounded incongruity is not removed. Of all results, this, of course, is to be taken with the most caution due to the unavoidable and repeatedly stated problem that any manipulation of a joke or cartoon can be expected to result in more than the intended change. However, there was only a tendency for humorous stimuli with backgrounded incongruity to be more comprehensible. The availability of the backgrounded incongruity has no influence on the mentioning of the foregrounded incongruity, and, not surprisingly, the backgrounded incongruity is not mentioned if not available. However, if the backgrounded incongruity is not available, people refer significantly more often to additional incongruities. If the backgrounded incongruity is available, no attention is focused on these additional incongruities, probably because of the dominance of the fore- and backgrounded incongruities.

Obviously, the backgrounded incongruity contributes to a remarkable degree to the perceived funniness of the stimuli. Backgrounded incongruities can't be removed without altering the joke or cartoon in the way that it loses substantial elements that are required for its appreciation. That additional incongruities are most often only mentioned in stimuli with removed incongruities leads to the question if these additional incongruities are not available in non-altered stimuli or whether these are not considered because the main and the backgrounded incongruity are so prominent.

A main issue in our experiment is why the humorous stimuli without backgrounded incongruity are rated to be less funny. As these were manipulated, the question emerges whether — particularly in the cartoons — the manipulation of the drawing in and of itself could have an effect on the funniness ratings. Nevertheless, when explicitly asked if they had noticed any manipulation, only two participants concurred. Since formal visual elements, e.g., the drawing style, might have an influence on funniness ratings (for an overview, see Samson and Hempelmann 2008) even if not realized consciously, we aimed to conduct a replication study with improved visual humorous stimuli.

In the second study we focused on cartoons only, as jokes were rated to be significantly less funny than cartoons in the first experiment. We assume that the reason for this lies in the artificiality of a joke presented in written form: A joke is probably perceived to be funnier if told by someone since timing, intonation etc. contribute significantly to the funniness ratings. In cartoons, on the other hand, much more information can be provided and processed that contributes to contextual information that lead to enrichment of the punch line.

3. Study 2

The aim of the second study was to replicate the results regarding the effect of the backgrounded incongruity on humor appreciation with improved stimuli. We decided to use only visual humor as canned verbal humor used in an experiment in written form had produced a decrease in funniness ratings in study 1.

3.1. *Method*

3.1.1. *Participants.* 134 participants (age: range from 15 to 72, mean: 30 years; 60 males and 74 females) took part in the experiment. They were recruited via advertisements on the blackboard at the University of Fribourg. Students accounted for 44%, 26% were employees and 30% other (e.g., pupil, housewife, freelancer).

3.1.2. *Stimuli.* After a careful reanalysis of the cartoons of study 1, we decided to use 14 of them. In particular, some with eliminated backgrounded incongruity were redrawn in order to improve the drawing quality. Furthermore, ten cartoons were added for each of which a second version was created

by eliminating the backgrounded incongruity. Hereby, we concentrated in particular on the quality of the drawing style. In total, 24 cartoons were used in study 2, each available in a version with backgrounded incongruity and in a version with eliminated backgrounded incongruity.

3.1.3. *Design and procedure.* In order to reach more participants, the experiment was designed as an online experiment. The potential participants were recruited through several channels (advertisements at the University of Fribourg and in classes at the Departments of Psychology and Economics). As before, two versions of the experiment were created: in each version, half of the cartoons were presented with backgrounded incongruity and the other half with eliminated backgrounded incongruity in random order. Therefore, each participant saw each cartoon only once (with or without backgrounded incongruity, 24 cartoons total, plus 1 warm-up). At the beginning of the online experiment, the participants were asked to provide standard demographic information such as age, gender, and profession. After each cartoon, they were instructed online to indicate whether they had understood the punch line of the cartoon or not. If they had understood the punch line, two 6-point ratings scales appeared: one for funniness and one for aversion. At the end, participants were given the opportunity to comment on the experiment and to contact us via email.

3.2. *Results*

A total of 144 participants started to rate the cartoons online, but 10 had to be excluded from the analysis because they did not finish the experiment. Seventy-five participants completed version one, 59 completed version two. The two versions did not result in differences in comprehensibility, funniness, or aversion ratings. Table 3 reports means and standard deviations for the stimuli with and without backgrounded incongruity for comprehensibility, funniness, and aversion. As comprehensibility did not meet the requirements of normal distribution for t-tests, we computed a Wilcoxon signed-ranks test for this variable. Otherwise, paired sample t-tests were applied.

Paired sample t-tests revealed that the cartoons with backgrounded incongruity were perceived to be funnier and less aversive than cartoons without backgrounded incongruity, but a Wilcoxon signed-rank test revealed no differences in comprehensibility between the two versions of the cartoons (see table 2 for the statistics).

Table 2. *Means and standard deviations for the three ratings (comprehensibility, funniness, and aversion) for the cartoons with and without backgrounded incongruity. Paired sample t-tests yielded significant differences in funniness and aversion ratings. A Wilcoxon signed rank test revealed no differences between the two groups of stimuli in comprehensibility.*

	with backgrounded INC *M (SD)*	without backgrounded INC *M (SD)*	Statistics
comprehensibility	.94 (.08)	.92 (.10)	$z = -1.67$, n.s.
funniness	3.75 (.85)	3.64 (.84)	$t(133) = 2.34$, $p < .05$
aversion	1.52 (.56)	1.58 (.60)	$t(133) = -2.22$, $p < .05$

Notes: N = 134. Only the cartoons that were understood were taken into account for funniness and aversion. Comprehensibility from 0 = not understood to 1 = understood; funniness from 1 = not funny at all to 6 = very funny; and aversion from 1 = not aversive at all to 6 = very aversive.

3.3. *Discussion*

Study 2 investigated with improved stimulus material whether the elimination of the backgrounded incongruity had an effect on comprehensibility, funniness, and aversion. Only cartoons were used in this study. Special care was taken in the manipulation to only remove the backgrounded incongruity and to otherwise affect the stimuli as little as necessary. Whenever the comprehensibility was not affected by the elimination of the backgrounded incongruity, it seems that the backgrounded incongruity contributed much to humor appreciation: cartoons with eliminated backgrounded incongruity were perceived to be less funny and provoked more aversion. Thus, it can be concluded more strongly from study 2 that backgrounded incongruity can be seen as an enhancer of funniness.

4. Study 3

The aim of study 3 was to investigate whether the elimination of the backgrounded incongruity had an effect on whether a humorous stimulus is perceived to be rather incongruity-resolution or nonsense humor. Previous studies investigated incongruity-resolution and nonsense humor with several variables supposedly serving as indicators for this distinction: In contrast to incongruity-resolution humor, nonsense humor leads to higher ratings of residual incongruity (rINC, Hempelmann and Ruch 2005), and higher absurdity ratings (Samson and Ruch 2005). These ratings have already been used in previous studies to classify humorous stimuli into incongruity-resolution and nonsense humor

(Samson et al. 2009; Samson and Meyer, 2010). In addition to these ratings, the present study used a further dimension that asked for the script opposition (degree of contrasts): Hempelmann and Ruch (2005) found the script opposition of incongruity-resolution humor more often to be of a actual/non-actual contrast, i.e., between two scripts, both of which are possible, potentially abnormal, but one is just actually not present in one interpretation of the text, and nonsense humor more often to be of a possible/impossible, where one script is indeed plainly impossible. The participants were given an elaborate explanation of the three degrees of contrast with stimulus examples, actual vs. non-actual, normal vs. abnormal, and possible vs. impossible, which is summarized in the following quotation from Hempelmann and Ruch:

> Only if both scripts are possible, is it meaningful to ask whether the second one is abnormal or non-actual, because an impossible script is abnormal in its impossibility and can only be presented as non-actual (. . .) . (. . .) Actuality and normality of opposite scripts, on the other hand, are not strictly dependent. (. . .) In sum, we assume more incongruity to be present in the contrast between abnormal and normal scripts than between a script that is actually there and another one that is (revealed to be) not there (cf. Raskin 1985: 111), while both the of them may very well be possible and normal. (Hempelmann and Ruch 2005: 363)

4.1. *Method*

4.1.1. *Participants.* Fifty-nine participants (age: range from 16 to 51, mean: 25 years; 28 males and 31 females) participated in the experiment. They were recruited via advertisements on the blackboard of the University of Fribourg. Forty-eight were students, 11 were employees.

4.1.2. *Stimuli.* The same stimuli as in study 2 were used.

4.1.3. *Design and procedure.* As in study 2, two online versions of the stimulus sets were created. In each version, half of the cartoons were with and the other half without backgrounded incongruity. Each participant saw only one version of each cartoon, 24 cartoons in total, plus 1 warm-up. The participants were instructed to rate each cartoon on absurdity and rINC on a 6 point scale, as well as to indicate the degree of contrast on which the punch line was based: actual vs. non-actual, normal vs. abnormal, or possible vs. impossible. In order to explain these contrasts, different stimulus examples were shown to

the participants with written explanations. Before the first cartoon was presented, the participants were asked to provide demographic information such as age, gender, and profession.

4.2. *Results*

Table 3 reports means and standard deviations for the stimuli with and without backgrounded incongruity for absurdity, rINC, and degree of contrasts.

Table 3. *Means and standard deviations for the three ratings (absurdity, residual incongruity, and rINC) and the degree of contrasts (actual/non-actual, normal/abnormal, and possible/impossible) for the cartoons with and without backgrounded incongruity.*

	with backgrounded INC *M (SD)*	without backgrounded INC *M (SD)*	*t* (df = 23)
absurdity	4.50 (.73)	4.20 (.76)	3.33, $p < .01$
rINC	3.23 (.50)	3.04 (.59)	2.16, $p < .05$
contrasts	2.54 (.54)	2.24 (.57)	3.12, $p < .01$

Notes: N = 24 cartoons. Absurdity from 1 = not absurd at all to 6 = very absurd, , rINC 1 = no rINC at all to 6 = much rINC) and the different contrasts (from 1 = actual/non-actual, 2 = normal/abnormal, and 3 = possible/impossible.

Paired sample t-tests revealed that the cartoons with backgrounded incongruity were perceived to be more absurd and that they had more rINC than cartoons without backgrounded incongruity. Furthermore, cartoons with backgrounded incongruity were more often of the contrast type impossible/possible than actual/non-actual (see table 3 for the statistics). Therefore, all of the three variables indicated that the cartoons move in the direction of incongruity-resolution humor rather than nonsense humor when the backgrounded incongruity is removed.

Furthermore, we calculated correlations across the cartoons to clarify whether absurdity, rINC, and the degree of contrasts capture the same phenomenon related to incongruity-resolution and nonsense humor. This analysis showed that there were intercorrelations between all three variables for both stimuli groups — with and without backgrounded incongruity. This indicates that all the variables capture this specific aspect of the structure of the joke (incongruity-resolution vs. nonsense humor).

Table 4. *Correlations between the three ratings (absurdity, residual incongruity, and rINC) and the degree of the contrast (from 1 = actual/non-actual, 2 = normal/abnormal and 3 = possible/impossible) for the cartoons with backgrounded incongruity (above diagonal) and without backgrounded incongruity (below diagonal).*

	with background inc.		
	absurdity	rINC	degree of contrasts
without background inc.			
absurdity	1	.67***	.42*
rINC	.57**	1	.42*
contrasts	.46*	.46*	1

Notes: N = 24 cartoons. Absurdity from 1 = not absurd at all to 6 = very absurd, rINC from 1 = no rINC at all to 6 = much rINC) and the different contrasts (from 1 = actual/non-actual, 2 = normal/abnormal, and 3 = possible/impossible.
*** $p < .001$, ** $p < .01$, * $p < .05$

4.3. *Discussion*

For all ratings that are sensitive to differences between incongruity-resolution and nonsense humor, the cartoons with backgrounded incongruity indicated more strongly to be nonsense humor. The presence of a backgrounded incongruity therefore leads to more unresolved incongruity and contributes to the perception that the cartoons are more nonsensical. The results of study 3 also show that the degree of contrasts is another variable that can be used to distinguish between incongruity-resolution and nonsense humor.

5. Main discussion

For the present study, jokes and cartoons with a backgrounded incongruity were identified. This incongruity was eliminated in a manipulated version of each stimulus with a likely, but unavoidable effect on other aspects of the stimuli. If the backgrounded incongruity is removed, the perceived main incongruity does not change (as it is not less often referred to), but in the manipulated version the participants focus on other incongruities that were not in the focus of interest in the original version. This might be related to the need for meaning, which is heightened after the exposure to absurdist art and nonsense humor (Proulx et al. 2010). In the same time it opens up interesting questions regarding the comprehension of nonsense humor and the explanations thereof—particularly in relation to personality characteristics. We know from several papers (e.g., Ruch and Hehl, 1998) that personality characteristics such

as sensation seeking or openness to experience correlate with the preference of nonsense humor over incongruity-resolution humor. However, it is unclear whether high sensation seekers, for example, would give different explanations (i.e. refer to more or less incongruities) than low sensation seekers. This would be an interesting question that might be addressed in future studies.

The present studies revealed further that humorous stimuli with removed backgrounded incongruity are less appreciated, as they are perceived to be less funny and create higher aversion ratings. Furthermore, the original versions (with backgrounded incongruity) are perceived as more nonsensical than the manipulated versions, which shows that the number of incongruities contributes significantly to the structure of the joke (incongruity-resolution and nonsense humor). The more incongruities in a humorous stimulus, the more the humorous stimuli are perceived to be nonsensical, possibly as some of the backgrounded incongruities remain unresolved but contribute essentially to the emotional response.

Interestingly, in previous studies on appreciation of incongruity-resolution and nonsense humor (e.g., Ruch and Hehl, 1998), incongruity-resolution humor was perceived to be funnier than nonsense humor. In the present study, the stimuli with removed backgrounded incongruity — which can be located rather on the incongruity-resolution than nonsense humor side — were less funny. However, these results do not necessarily contradict each other. We do not claim that humorous stimuli with and without backgrounded incongruity can be equated with the distinction of incongruity-resolution and nonsense humor. We know only, that the removal of a backgrounded incongruity shifts the stimulus more to the incongruity-resolution side, probably by rendering it more "normal": if animals have a funny conversation, this might be more nonsensical than if human beings (removed backgrounded incongruity: talking animals) have the same funny conversation as talking animals are more absurd, rather impossible and less likely than talking human beings. However, it might be possible that our stimuli were in general more on one side of the continuum of incongruity-resolution and nonsense humor. To gain more knowledge about the relationship between incongruity-resolution and nonsense humor and the presence of backgrounded incongruities, it would be interesting to analyze whether the incongruity-resolution and nonsense jokes and cartoons of the 3 Joke Dimension Test (3 WD) possess more or less backgrounded incongruities, as was suggested earlier (Ruch 1981), which will require individual analysis of the stimuli.

Thus, this multidisciplinary study informed by experimental psychology and linguistic semantics was able to support the theoretical considerations of

Hempelmann and Attardo (2010) about the very different roles that foregrounded and backgrounded incongruities play, in particular, that they help differentiate between humorous and non-humorous texts which present resolved incongruities, as well as between types of humorous texts in terms of the dimension nonsense/incongruity-resolution.

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Appendix: Sample stimulus descriptions (numbering according to study 3)

Warm-up cartoon:
A man and a woman watch a family of ducks cross the street in front of their car. The mother duck is followed by one chick and a grinning snake in whose body we see three lumps, presumably the other chicks.

Cartoon 1A:
In a desert landscape a beaver is sitting in front a cactus. The beaver is holding an electric razor in its paw, the cactus is missing its needles on the side facing the beaver. The cactus is thinking: "I'm such an idiot for letting him borrow the razor."

Cartoon 1B:
In a desert landscape a beaver is sitting in front a cactus. The beaver is holding an electric razor in his hand, the cactus is missing its needles on the side facing the beaver.

Cartoon 4A:
A dead man is lying on the ground, bleeding profusely, a knife stuck in his back. Next to him stands personified Death in his hooded cloak, holding a scythe. He says: "I knew it. You are a spring type. Red fits you perfectly."

Cartoon 4B:
A dead man is lying on the ground, bleeding profusely, a knife blade stuck in his back. Next to him stands another man, holding the handle of the broken knife. He says: "I knew it. You are a spring type. Red fits you perfectly."

Cartoon 10A:
Two penguins in a snow-covered landscape, one is pointing excitedly, the other is moving excitedly in that direction. One says, "He just spoke his first word!" The other: "Great! What is it? Mama? Papa?" In the next panel the two penguins are looking at a penguin chick lying in the snow, saying: "Damned cold!"

Cartoon 10B:
Two eskimos in a snow-covered landscape, one is pointing excitedly, the other is also happy. One says, "He just spoke his first word!" The other: "Great! What is it? Mama?

Papa?" In the next panel the two are looking at an eskimo baby lying in the snow, saying: "Damned cold!"

Cartoon 15A:
Santa and a reindeer on its hindlegs are standing in a room with the floor covered in envelopes. Santa is holding an empty sheet of paper and says, "I assume this child wants to get a pen." The reindeer says, "I guess."

Cartoon 15B:
Santa is standing in a room with the floor covered in envelopes. He is holding an empty sheet of paper and says, "I assume this child wants to get a pen."

Cartoon 16A:
Two snowmen are next to each other. Both are built from three balls of snow. The one on the left has one of its snowarms attached to the lowest ball, the mouth is on the forehead, the eyes are sideways on the chin and the cooking pot that functions as its hat hangs on the side of the head. Yellow letters in the snow in front of it spell "Picasso". The one on the right has all parts where they belong, but the handle from the side of the cooking pot has broken off and is lying in front of it. Yellow letters in front of it spell "Van Gogh."

Cartoon 16B:
Two snowmen are next to each other. Both are built from three balls of snow. The one on the left has one of its snowarms attached to the lowest ball, the mouth is on the forehead, the eyes are sideways on the chin and the cooking pot that functions as its hat is on the side of the head. It is holding a sign that reads "Picasso". The one on the right has all parts where they belong, but the handle from the side of the cooking pot on its head has broken off and is lying in front of it. It is holding a sign that reads "Van Gogh."

Cartoon 19A:
A man wearing a chasuble and a mitre is holding a stone tablet with an inscription. He is standing in front of a sofa with one seat cushion lying on the floor next to a vacuum cleaner. A caption says, "The Pope discovers the eleventh commandment." The tablet reads, "XI — Thou shalt enjoy sex." The pope is thinking "Shit."

Cartoon 19B:
A man wearing a chasuble and a mitre is holding a stone tablet with an inscription. He is standing next to a shrubbery and a picket fence. A caption says, "While on a walk the Pope discovers the eleventh commandment." The tablet reads, "XI — Thou shalt enjoy sex." The pope is thinking "Shit."

Notes

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1. This cartoon is by the German cartoonist Joscha Sauer.
2. Previous experiments showed that stable types of differences influence the appreciation of humorous material. These were assumed to include content (sex), but to be mainly structural: One such important stimulus characteristic is the differentiation of incongruity-resolution and nonsense humor (e.g., Ruch, 1981). However, incongruity-resolution and nonsense can also be seen as two extreme points of a continuous dimension. Samson and Ruch (2005) showed that with ratings of absurdity/grotesqueness, stimuli can be classified into incongruity-resolution humor and nonsense humor as well.
3. Only one participant mentioned the backgrounded incongruity in the version with eliminated backgrounded incongruity as he knew the original cartoon.

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