

# This Study is Intentionally Left Blank

## A systematic literature review of blank pages in academic publishing\*

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### Abstract

Common in all areas of publishing, the phrase “*This Page is Intentionally Left Blank*” has been found in peer-reviewed academic articles costing \$30 to access. To the best of our knowledge, this paper represents the first known review of Intentionally Blank Pages (IBPs). We looked at the variations in samples from the existing literature, and quantified the amount of blankness on such pages using a new metric, the “Blankness Defect Rate” (BDR). After showing that most blank pages are defective, we suggest a number of alternatives, factually correct or less ambiguous. Finally, we offer some possible explanations for this phenomenon, including “editor’s block”, a creative impairment similar to the well-known “writer’s block”, and identify avenues for future research on this critical topic.

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### 1. Context

The phrase “This Page is Intentionally Left Blank” is ubiquitous in the world of printed text, appearing most notably in instruction manuals and exam papers. It is generally accepted that its purpose is to indicate that the page on which it appears is purposely bereft of content. Yet the very inclusion of this phrase nullifies its intent: the page is no longer blank. Indeed, it is now intentionally *not* blank. By virtue of self-reference, the phrase denies its own existence, despite the fact that we know it is there. This is, essentially, a rather banal,

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academic version of René Magritte’s surrealist work, *The Treachery of Images* (Figure 1).



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*Figure 1: Comparison of self-referentialism in surrealist art and academic literature.*

The US Code of Regulations (1984) actually mandates that blank pages in certain books and pamphlets must be marked as such.<sup>1</sup> As such, they are especially common in technical works. This has led to a large number of people attempting to solve the philosophical conundrum such non-blank blank pages create, often through online fora and crowdsourcing platforms. The Office of the General Counsel at the US General Accounting Office, acutely aware of the distress caused, purported in 2001 to have resolved the conundrum in its *Principles of Federal Appropriations Law* (Second Edition, Volume IV).<sup>2</sup> Text on page ii, which is otherwise blank, reads “*This page is intended to be blank. Please do not read it.*” However, this appears to have only further entrenched the philosophical contradictions, and the subsequent Third Edition contained no such text on its blank page.

It was recently discovered via social media that a number of peer-reviewed academic ‘articles’, costing \$30 to access, consist solely of one blank page (Figure 2).<sup>3</sup> In order to determine what value was being added to these pages by the peer review process that they have undergone, we set out to investigate their blankness. To the best of our knowledge, this is the first systematic study of intentionally blank pages (IBP) in the academic literature.

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<sup>1</sup> The Code of Federal Regulations of the United States of America (1984), Section 47, §61.93.

<sup>2</sup> <https://www.gao.gov/special.pubs/d01179sp.pdf>.

<sup>3</sup> Tweet dated 13 Oct 2014, by @fxcoudert:

<https://twitter.com/fxcoudert/status/521675319322112000>



**Figure 2:** screenshot of the ScienceDirect checkout page, accessed via an institutional login from SciencesPo, showing the cost of an IBP taken from *Verified Synthesis of Zeolitic Materials* (2001).

## 2. Methodology

A total of 56 individual IBPs were found on the online [ScienceDirect](https://www.sciencedirect.com) platform, 24 of which were immediately available for purchase and study. These appear to be a cross-disciplinary selection, so it is felt that this will give a good indication of the treatment of IBPs over a wide range of subjects. It is notable that these IBPs are largely from books. It appears that journals generally do not leave blank pages, intentionally.

## 3. Analysis

Out of 24 PDFs, only one was truly blank. This was checked by rendering of its contents at high resolution (600 dpi) followed by a search for non-white pixels. The remainder were manually examined, showing some variety in their style (Figure 3). One used a sans-serif font, although the majority (22 out of 24) used a rasterized sans serif font in varying sizes and positioning.

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**Figure 3:** Variability in font family, size and resolution of the text on intentionally blank pages.

### 3.1. Blankness

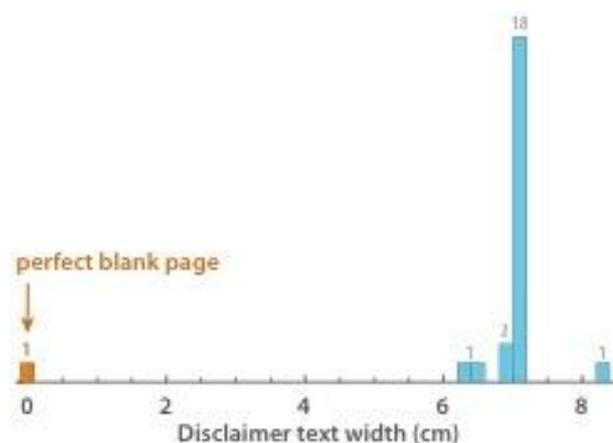
Despite their claim to have been ‘intentionally left blank’, our analysis shows that almost none of the IBPs have, in actual fact, been left blank: all but one of them contain the text “*This Page is Intentionally Left Blank*”. The exception is an IBP from *Parallel Computational Fluid Dynamics 2000* (2001). The reason for the omission of the informative text on this page remains wholly unclear.

The prevalence of text on these ‘blank pages’ will either disappoint readers that have paid \$30 for a product that

was falsely advertised, or raise existential questions such as, “what *is* a blank page?” and “why did I choose a career in academia?”

The amount of blankness varies, which can be quantified using a factor we have named the “blankness defect rate” (BDR). The BDR can be defined as the amount of space on the page that is in fact not blank, primarily caused by the presence of text. Automated determination of the BDR was undertaken using custom *Mathematica* scripts. The primary factor affecting the BDR was the size of the informative text (Figure 4), with larger text leading to a higher BDR. The font used may also affect the BDR, whereby fonts with serifs cause higher BDRs, due to their occupying more space. Additional interference effects may also be present.

The average BDR of the sampled IBPs is 0.163% ( $\pm 0.04\%$ ), while the average amount of non-blank space (i.e. ink) is  $0.830 \text{ cm}^2$  ( $\pm 0.204$ ).



**Figure 4:** Histogram of disclaimer text width on IBPs. The data point corresponding to the single perfectly blank page in our sample is highlighted in orange.

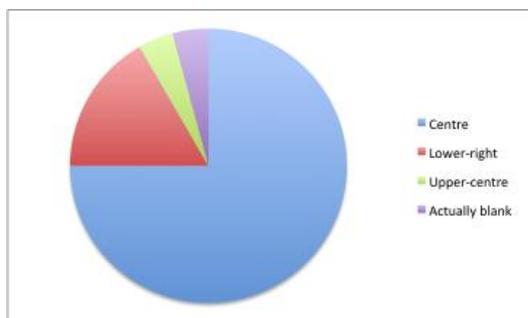
### 3.2. File Size

The total size of the 24 IBPs is 237 kB, averaging almost 10kb per page. Individual IBPs varied from 7 kB to an

impressive 19 kB, as can be seen in Appendix 1. By contrast, our control has a size of merely 365 bytes. Even the peer-reviewed genuinely blank IBP was 8.2 kB in size. To put this into perspective, only 144 average IBPs provided by journals can be stored on one standard floppy disk; our control allows for the storage of 3945 IBPs. Printing these would certainly provide enough blank pages for most practical purposes.

### 3.3. Positioning of Text

Visual observation shows that most pages have their text placed centrally, both horizontally and vertically. There is some variation, however, most commonly horizontal displacement of the text to the right and downwards vertical displacement. This distribution can be seen in Figure 5.



**Figure 5:** Chart showing text alignment across the sampled IBPs.

The pages are all designed to be viewed in portrait mode, with no line-breaks being used. What is intended to occur if pages are purchased for use in landscape orientation is unclear, but the text will be misaligned in such situations, causing readers to have to turn either their heads or their reading material in order to confirm that the page is indeed blank.

Being the only truly blank IBP sampled, the IBP from *Parallel Computational Fluid Dynamics 2000* (2001) has no predetermined orientation or alignment. In fact, it may be rotated and/or reversed at will, maintaining its original character at all times.

### 3.4. Cost

The publisher-provided IBPs furnish 31 characters to the reader for \$30 (Figure 2), a cost of approximately \$1.33 per character. Our control was created in a matter of minutes, for free, using a simple text editor. Considering the current pressure on research funding, and to ensure no unnecessary spending of taxpayer money is undertaken, we recommend the use of our control IBP in future. We have therefore placed it under the Creative Commons CC0 license, and made it available online (DOI: 10.5281/zenodo.12593).

At \$30 per PDF, anecdotally a common price point for 'scientific' papers, readers pay an average of \$33.58 per square centimetre of ink ( $\text{cm}^{-2}$ ). There is some variability in this price, owing to variations in the BDR. The most expensive blank page costs \$46.35 /  $\text{cm}^2$  (page 16 of *Joe*

*Grand's Best of Hardware: Wireless and Game Console Hacking*); the least expensive<sup>4</sup> is a mere \$23.21 /  $\text{cm}^2$  (page 129 of *Electronics Reliability and Measurement Technology*).

Given that the publisher's cost are partly linked to the size of files hosted on their web servers, a further perspective to consider is the price per MB. These PDF copies of the sample IBPs are sold at \$3,331.85 per MB ( $\pm$  \$640.97). We note that publishers could substantially increase profit margins by selling truly blank IBPs. Our defect-free IBP, fully conforming to PDF 1.1 and later specifications, is a mere 365 bytes (0.000365 MB). If sold at the same nominal price of \$30, that would represent \$86,184 per MB. Alternatively, if sold at the same price per MB as the sampled IBPs, a true IBP need cost only \$1.16. This would greatly alleviate the heavy financial burden borne by academic institutions who frequently require blank pages.

## 4. Possible explanations

One possible explanation for the inclusion of text in the IBPs is that the stock phrase used in the majority of the sampled papers is, in fact, intended as a *kōan*, i.e. a statement used in Zen practice to provoke the "great doubt" and test a student's progress. If this were to be true, the absence of any philosophy or religious texts from the sample is surprising. Such a hypothesis would suggest that the readers of publications such as *Frontiers in Dusty Plasmas* and *Asymptotic Methods in Probability and Statistics* are well ahead on the Zen-curve, an unlikely conclusion.

Our preferred hypothesis is that the blank PDFs provided by journals have a higher file size and cost due to their 'added value'. This value has been added through a rigorous process of peer-review and professional copyediting, and usually takes the form of the added text. By contrast, our control IBP lacks this additional text and has not been peer-reviewed according to normal procedures. The publisher supplied pages are therefore less confusing to most readers, who would otherwise be left to infer for themselves that the pages are, in fact, blank. We are considering the addition of similar text to all blank pages in our possession, and printers.

There is nevertheless an alternative, intriguing explanation. As all writers are well aware, the *writer's block* is well-established phenomenon among both professional and amateur writers. Could this be the first reported case of *editor's block*? The presence of blank pages in multiple domains may imply that several editors have fallen to this creative impairment. Indeed, given the volume of published academic texts, it is unlikely that just one editor would be responsible for this series of blank pages. Unfortunately, it is not a standard practice to report the name of the editor associated with each IBP and it is therefore impossible to draw a firm conclusion. We hope that this work might instigate interest from

<sup>4</sup> We couldn't quite bring ourselves to say "the cheapest".

social and behavioural specialists to further investigate this intriguing possibility.

## 5. Alternatives

Our analysis suggests the intentionally blank pages are flawed in a number of ways. Here we suggest some alternatives, the use of which will vary depending on the desired outcome.

Where the intention is to reassure the reader that they have come to the end of the current text, some syntactically meaningless symbols at the end of said text can indicate that it was not left blank accidentally. ‘Dingbats’ (\*♥\*♦♣ etc.) have been successfully used for this purpose. We propose that the dingbats method may now be modernised through the use of ‘emojis’. Emojis may provide a novel method of conveying to the reader that the text has ended. For example:

- 🏁;
- 🖋️📖📄✖️👉; and
- 🇫🇮 (finish).

Otherwise, the traditional blank page paradigm may be maintained with some alteration to the current standard phrase. “*There are only eight words on this page*” provides a neat solution, or the text may be more comprehensively reformulated thus:

*The page on which this statement has been printed has been intentionally left devoid of substantive content, such that the present statement is the only text printed thereon.*

If using typesetting software, such as LaTeX, it may also be possible to automatically state exactly how much blank space is present on a page. This would render a message such as “*This Page Intentionally Left 99.855% Blank*”. A proof of concept was developed,<sup>5</sup> by calculating the BDR in an iterative manner, meaning that this could (in theory) be applied to all intentionally blank pages. This method both eliminates the usual existential questions posed by self-reference, and is satisfyingly accurate.

If the primary intention is indeed to provide the reader with a blank page, all text should be omitted. *Parallel Computational Fluid Dynamics 2000* (2001) and the control page from this study provides an example that may be replicated in other contexts.

It should be noted that a number of interesting alternatives are found outside the traditional scientific literature. Andy Griffiths' book, *Just Stupid!*, begins with a cartoon snail saying: “*This page would be blank if I were not here telling you that this page would be blank if I were not here telling you that...*” on an endless loop.

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<sup>5</sup> We call an “accurate defective blank page”. It is demonstrated here: <https://github.com/fxcoudert/citable-data/blob/master/accurate-defective-blank-page.pdf>

Don Novello's, *The Lazlo Letters* (1977), ends with several pages marked “FREE PAPER!” Iranian novelist Reza Amirkhani's book, *Man-e-oo* (‘His Ego’), reportedly contains an entire chapter consisting of blank pages. However, we have been unable to verify whether the pages remain blank when translated into English from the original Persian.

## 6. Directions for Future Research

In light of the significance of these new findings, we suggest that this paper represents the dawning of brave new era beginning in the field of bibliometrics. In addition to their prevalence in English, we suspect that IBPs are found in other languages. Whether these are present in the scientific literature is unknown, since the scientific community largely uses English as a lingua Franca. Regardless, further investigation may reveal further insights and as such, should be examined in much more detail.

[Personal communication](#) from ScienceDirect indicates their intention to remove these pages. This would hamper future efforts to analyse IBPs. However, blankness itself may be an interesting topic of further study, and prevalence of blankness in other areas remains unclear at this juncture. Further avenues of research that may prove fruitful include the blankness of: the digital world, such as [websites](#) and [tweets](#); the physical world, such as [walls](#) and [signs](#); and other aspects of academic publishing, such as footnotes,<sup>6</sup> and even entire [academic articles](#).

## 7. Conclusion

We recommend the use of our blank control page for situations where a truly blank page is desired, or where a landscape orientation is required, since publishers have not allowed for their blank pages to be used in such situations. Alternatively, the blank page from *Parallel Computational Fluid Dynamics 2000* (2001) provides a peer-reviewed alternative for high-quality applications. Where there is a need to maintain the functionality of the additional text, any of the options proposed in this paper are appropriate. Indeed, different options are suitable for different applications, depending particularly on the need for brevity, accuracy, and humour in each unique case.

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## Afterword

It has subsequently come to our attention that ScienceDirect has taken the drastic step of removing all IBPs from its search results. In response to this development, we have taken the decision make these papers publicly available to ensure that these important contributions to science are not lost to future generations of researchers.

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<sup>6</sup> This footnote is intentionally left blank.

While we are aware that this action is in violation of copyright laws, we urge ScienceDirect, and the publishers of the IBPs, not to seek legal redress.

Minimal-size perfectly blank PDF page:  
<http://dx.doi.org/10.6084/m9.figshare.1230066>

### **Additional Resources**

Intentionally blank pages:  
<http://dx.doi.org/10.6084/m9.figshare.1230060>

## Bibliography

<http://www.this-page-intentionally-left-blank.org/>

[This Page Intentionally Left Blank](#) BBC (sourced November 2014)

[This page intentionally left blank](#) - Science Direct (sourced November 2014)

<http://web.archive.org/web/20070521042812/http://public.srce.hr/~zheimer/blank.htm>

' ' in *Parallel Computational Fluid Dynamics 2000*, 2001

'This Page is Intentionally Left Blank' in *Asymptotic Methods in Probability and Statistics*, 1998

'This Page is Intentionally Left Blank' in *Brain Theory, What Is a Brain?*, 1996

'This Page is Intentionally Left Blank' in *Collection of Simulated XRD Powder Patterns for Zeolites*, 2001

'This Page is Intentionally Left Blank' in *Conservation Biological Control*, 1998

'This Page is Intentionally Left Blank' in *Electronics Reliability and Measurement Technology*, 1998

'This Page is Intentionally Left Blank' in *Estimator's Electrical Man Hour Manual Third edition*, 1999

'This Page is Intentionally Left Blank' in *Estimator's Piping Man Hour Manual Fifth Edition*, 1999

'This Page is Intentionally Left Blank' in *Frontiers in Dusty Plasmas, Revisited*, 2000

'This Page is Intentionally Left Blank' in *Handbook of Optical Constants of Solids*, 1997

'This Page is Intentionally Left Blank' in *Handbook of Palladium Catalyzed Organic Reactions*, 1997

'This Page is Intentionally Left Blank' in *Hedge Fund Investment Management*, 2006

'This Page is Intentionally Left Blank' in *Industrial Hygiene Engineering Second Edition*, 2000

'This Page is Intentionally Left Blank' in *Intelligent Production Machines and Systems*, 2006

'This Page is Intentionally Left Blank' in *Joe Grand's Best of Hardware: Wireless and Game Console Hacking*, 2006

'This Page is Intentionally Left Blank' in *Metal Nanoclusters in Catalysis and Materials Science*, 2008

'This Page is Intentionally Left Blank' in *Parallel Computational Fluid Dynamics 1996*, 1997

'This Page is Intentionally Left Blank' in *Parallel Computational Fluid Dynamics 1999*, 2000

'This Page is Intentionally Left Blank' in *Programmer's Ultimate Security DeskRef*, 2004

'This Page is Intentionally Left Blank' in *Projects for Calculus Second Edition*, 1998

'This Page is Intentionally Left Blank' in *Recent Research Towards Advanced Man Machine Interface*

'This Page is Intentionally Left Blank' in *Science Progress in China*, 2003

'This Page is Intentionally Left Blank' in *Stealing the Network How to Own an Identity*, 2005

'This Page is Intentionally Left Blank' in *Through Spoken Language*, 1996

'This Page is Intentionally Left Blank' in *World Fuel Cells*, 2002

**Appendix 1:** Summary of Blank Pages obtained, detailing size, ordered by year of publication.

<b>Size</b>	<b>Publication</b>	<b>Publication Year</b>
8.6K	Brain Theory, What Is a Brain?	1996
8.6K	Recent Research Towards Advanced Man Machine Interface Through Spoken Language	1996
19K	Handbook of Optical Constants of Solids	1997
13K	Handbook of Palladium Catalyzed Organic Reactions	1997
9.3K	Parallel Computational Fluid Dynamics 1996	1997
8.9K	Asymptotic Methods in Probability and Statistics	1998
8.9K	Conservation Biological Control	1998
7.1K	Electronics Reliability and Measurement Technology	1998
12K	Projects for Calculus Second Edition	1998
8.6K	Estimator's Electrical Man Hour Manual Third edition	1999
11K	Estimator's Piping Man Hour Manual Fifth Edition	1999
7.0K	Frontiers in Dusty Plasmas, Revisited	2000
8.5K	Industrial Hygiene Engineering Second Edition	2000
8.1K	Parallel Computational Fluid Dynamics 1999	2000
11K	Collection of Simulated XRD Powder Patterns for Zeolites	2001
8.2K	Parallel Computational Fluid Dynamics 2000	2001
8.6K	World Fuel Cells	2002
11K	Science Progress in China	2003
8.6K	Programmer's Ultimate Security DeskRef	2004
8.6K	Stealing the Network How to Own an Identity	2005
8.4K	Hedge Fund Investment Management	2006
12K	Intelligent Production Machines and Systems	2006
7.9K	Joe Grand's Best of Hardware: Wireless and Game Console Hacking	2006
13K	Metal Nanoclusters in Catalysis and Materials Science	2008

**Appendix 2: Sample reformulated IBP**

**The page on which this statement has been printed has been intentionally left devoid of substantive content, such that the present statement is the only text printed thereon.**

**Appendix 3: Landscape IBP**

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**Appendix 4:** Truly blank IBP (see next page)

