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The Adventure of Argument: Hypothesis-Making in Fictionalised Crime

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ABSTRACT: Argumentation plays a critical role in the consumption of crime narratives. The public's unquenchable thirst for crime hasn't been slaked since the rise in the genre's popularity, providing a rich dataset through which to investigate the different kinds of reasoning that play a role in the narratives of crime. This paper will explore the different ways people form hypotheses and the evolution between different hypotheses written within one narrative.

KEYWORDS: Agatha Christie, fiction, hypotheses, whodunnit

1. INTRODUCTION

What does a good hypothesis look like? This question sets up the notion that some hypotheses are better than others and these features are potentially distinguishable. Investigating this process and attempting with this initial pass to extract possible good hypothesis features requires a carefully chosen platform. Fiction, whilst having downsides in its removal from reality, offers several benefits; its closed box environment allows a firm conclusion, a timeline that is measured in pages rather than months or years, and where all necessary evidence can be included in the space. Real investigations often have no concrete conclusion and have missing evidence and thus crime fiction offers a stable platform for an initial look into this process. By using a stable, if somewhat artificial environment where there are definitive answers, it can be easier to obtain clearer analyses of hypotheses. The author, therefore, had to be chosen with care. An author whose novels were solvable, numerous, and use *fair play*: where the reader can solve the mystery with what is included in the text. The artificiality of fiction acts as a proxy to real investigative work; it borrows its legitimacy and copies its content to create a serious, if pretend, environment.

Hypothesising is the act of reasoning on the given facts, but is something that cannot, yet, be proved and is thus hypothetical. In the landscape of narrative fiction, this act of hypothesising is within a finite set of facts: that which the author has given. The ideal form of argument is one in which the conflict can be resolved and the matter concluded. In real investigative work, this may not be a given. There is some inherent tension in the need for the hypothesis to be resolved and how important the hypothesis itself is. Disagreeing about where to have lunch has significantly lowered stakes and fewer consequences to prosecuting a suspect of premeditated murder. Hypothesis-making may not always have high stakes but often it's a type of reasoning that comes with higher stakes and more serious topics. The apparent trivial nature of the murder mystery novel does instead allow an initial

stable platform upon which hypotheses can be investigated and is something that can be pushed into real use-cases in a later iteration. Approaching literature from an argumentation perspective isn't new: there has been research into using narrative as arguments (Olmos, 2013), how arguments and narratives fit together (Tindale, 2017), and how novels themselves can be arguments (Plumer, 2015).

Hypotheses themselves appear to exist in a somewhat liminal realm where it is a reasoning unit that has not yet been verified and, depending on the use-case (such as investigative work or intelligence), may never be. Research in hypothesis-making in intelligence includes ACH (analysis of competing hypotheses); a structured analytical technique used in intelligence analysis, it attempts to eliminate confirmation bias by forcing the analyst to examine alternative hypotheses and to mark evidence as consistent or inconsistent (Heuer, 2005). It does, however, have its detractors. One such detractor is ACH's vagueness in what constitutes inconsistent evidence (Dhami, Belton, Mandel, 2019). Hypotheses are also used in investigative work with police, such as to determine their ability in their field (Fahsing & Ask, 2018). Within this work, a small exploratory study was conducted to gain insight into the ways in which people hypothesise and the differences between them. Participants were asked to stop at certain points in the narratives and, with the evidence so far available to them, make a hypothesis about who was the most likely culprit. This study was done in order to gain an understanding of the potential value within this investigation. Whilst generalisations and patterns cannot be deduced at this stage, the study's purpose was entirely for the initial and preparatory stages of this work. Sections 2 will delve into more depth about the methodology, Section 3 will discuss the pilot study, and Section 4 will discuss the findings of the exploratory study.

2. EXPERIMENTAL METHODOLOGY

Using a fictional environment lends a lot of benefits: it creates a platform to investigate the formation of hypotheses in a stable environment. In real-world data, crucial evidence is often missing or incomplete, which contrasts with a well-written and fair-play detective novel, where everything necessary to solve the mystery is given to the readers piecemeal. The critical reader has a chance of reaching the correct conclusion with what is given to them.

2.1 Study

The study involved three participants reading four texts. Two novels and two short stories by Agatha Christie were chosen to ensure their use of fair play and that the participants could indeed reason their way through the plots. The novels were: *Evil Under the Sun*, 1941, and *Peril at End House*, 1932; and the short stories were: *The Case of the Perfect Maid*, 1985, and *The Case of the Spanish Chest*, 1960. Participants all had varying levels of familiarity with the genre: one had extensive familiarity and had read some Agatha Christie before, one was used to the genre but hadn't read the author, and the last was totally new to the genre and author. They were given four weeks to read the stories and to hand in their hypotheses. Throughout each story there were two to four different points at which the participants were asked to stop and reflect on what they had read so far in order

to make a hypothesis as to *whodunnit* and why. The instructions given to them were deliberately underspecified: they could choose the length of their hypotheses, the style, and what they could include. This was done purposefully to gather as much information as possible and to create as naturalistic an environment as possible. It was important to first feel out the area and understand how untrained people understood and wrote hypotheses. Whilst a more detailed and restricted brief could have been given, it would have stymied the attempt to gather these naturalistic styles of hypothesising. The last thing that this study intended to do was to close off avenues that participants may wander down and give insight into. Although the only real strong direction was noting down who they suspected and their reasons for that, this purposefully vague briefing allowed for some participants to not fully commit to who they thought was the culprit: something to be considered for the future.

Each short story was given two hypothesis points: points in the text where the participant would stop reading and make a hypothesis with what they had read so far. One novel was given three, and the other four, hypothesis-points. Having read through the first section, participants would then pause and write down who they thought was the culprit and why. The only firm instruction they were given was to write down who the participants thought did it with their reasons for that. After doing so, they would continue to read until the next hypothesis-point, and then write their hypothesis down, repeating this task until the end. After they completed a text, they could then move onto another and repeat the same procedure. Ethics approval for this study was granted by the School of Science and Engineering of the University of Dundee¹. The corpus will be made publicly available in the future.

3. PILOT: PARTICIPANT 1

Allowing participants the freedom to write interesting hypotheses whilst remaining on task prompted the use of a pilot participant. Participant 1 was guided through the process with each story. They would read and make hypotheses, waiting for the study lead to give feedback before moving to the next story. For instance, their first hypothesis included bullet points of events and facts from the case; their second was closer to what would later be asked for in the brief but by accident missed doing the initial hypothesis; the third attempted a suspect list with their possible motives and opportunities attached; and the fourth was then the blueprint for what was asked of Participants 2, 3, and 4. Out of these four stories, their third attempt identified one of the murderers. Participant 1's use of strong language, rather than hedges, stood out: for instance, "there are only 6 possible suspects". There was a clear fixation in one of the stories, *The Mystery of the Spanish Chest*, which led to confirmation bias. The narrative compared the situation to one in Shakespeare's *Othello*. Participant 1 took this and ran with the allusion, but to the wrong conclusion. Each narrative Participant 1 worked through used a different technique to solve it. For example, in *Evil Under the Sun*, Participant 1 states, "the best place to start to solve this mystery is motive not alibis". Within the same text, Participant 1 develops one of their ideas and carries it into a later hypothesis which helps to catch the murderer. There was also discourse that involved the medium itself: "Agatha Christie doesn't usually have hired murderers in her stories". This occurs in the study as well and can be compared with real-life investigations,

¹ Case number: UOD-SSREC-RPG-Comp-2022-001.

where statistics (“82% of women murdered are by men they know”²) bias, highlight, or lean more weight on one hypothesis over another.

4. FINDINGS FROM STUDY

Warning: spoilers ahead! This section will break down the participant’s hypotheses within the different narratives to discuss some of the ways participants hypothesised. While it is interesting to see what the participants got right about the stories, equally interesting is what they missed, dismissed, or carried over into their next hypotheses. There are some gaps in the data with some of the hypotheses given in by participants.

4.1 *The Mystery of The Spanish Chest*

The Mystery of the Spanish Chest is a Poirot short story: a woman whose husband has been murdered comes to Poirot for help – the man she is in love with has been arrested for it. The murdered man, Clayton, is found within a chest, stabbed with a stiletto. The five apparent suspects include the wife Margharita Clayton, Rich (the man she loves), McLaren (who’s always loved her), and the Spences (a couple who are new friends to the group). The group has a party the night before at Rich’s flat. The second hypothesis point includes the new information that Poirot makes a reference to *Othello*, the chest has some holes drilled in it, and Jeremy Spence dances with Mrs Clayton at the party. In conclusion, McLaren, who loves Mrs Clayton, murders Clayton and frames Rich. Two out of three participants were correct with this text.

4.1.1 *Participant 2*

The participant, in their initial hypothesis, correctly identified the murderer. They connect Poirot’s comments about Mrs Clayton, how she could be the kind of woman who “though innocent themselves, [are] the causes of crimes” with McLaren’s remark, “whatever Margharita [Clayton] wants – I’ve always done what she wanted”. The participant also caught that Clayton may have been at the party and that the telegram was made up, since Clayton was killed in the evening and the party started earlier. They inferred from Clayton being very jealous and Margharita mentioning how unhappy she was in her marriage, that McLaren may have been spurred to murder Clayton for Margharita’s sake. Within the second hypothesis, however, this hypothesis was dropped, and the suspect pool was widened as the participant suspected Linda Spence, in collusion with everyone but Margharita and Rich. This was in large part due to the reference to *Othello* that both this participant and Participant 1 misinterpreted. Thus, they ignored their previous hypothesis, other than to note that McLaren may have been involved and kept quiet due to his interest in Margharita.

² <https://www.weforum.org/agenda/2020/11/violence-against-women-femicide-census/>

4.1.2 Participant 3

The participant dispelled the butler and Rich as suspects due to the location of the body; they had opportunity to dispose of the body, although Participant 3 noted that the butler may have done it to frame Rich but “we have no indication that he has motive to do so”. Mrs Clayton was also cleared since it was unlikely to call in a world-famous detective who could figure out it was her. This initial elimination left Participant 3 the other guests to investigate. Participant 3 noted the possibility that since the telegram was not seen, it may have been faked or made up. At the end of their first hypothesis, Participant 3 stated that their suspicions rested more strongly on the Spences working together as a team, or else McLaren. This did change in the second hypothesis, where they changed their opinion to McLaren. Participant 3 was the only participant to use the allusion to *Othello* in a way that helped them to solve the mystery: “Iago is trusted by Othello and betrays him: McLaren is Clayton’s best friend”.

4.1.3 Participant 4

Within the first hypothesis, Participant 4 noted “This potentially suggests McLaren and wife together” and then, “Spanner in the works. My nice neat plan of Mrs Clayton and McLaren working together has sadly fallen apart”. It suggested that the participant wrote down part of the hypothesis before reaching the hypothesis point and then was forced to refute part of this when they reached that point. This rejection of the previous hypothesis wasn’t common in general amongst participants. The initial piece of evidence that called suspicion to McLaren was how he lived the closest to Rich’s flat, and therefore could return after the party quickly. The women were ruled out, because although killing with a stiletto knife wouldn’t be difficult, manhandling Clayton’s body into the chest would be. Participant 4 noted that Jeremy Spence was the one dancing with Margharita and McLaren was the one controlling the music. If Clayton climbed into the chest voluntarily, which the holes in the chest strongly suggested, he may have had a friend who convinced him of an affair. This friend wouldn’t be the one to dance with Clayton’s wife, but instead be the one to control the room, i.e., McLaren. There was no discussion of the allusion to *Othello* within this set of hypotheses.

4.2 The Mystery of The Perfect Maid

The Mystery of the Perfect Maid is a Miss Marple short story. Miss Marple becomes involved in some village drama: a housemaid is fired for stealing, for which she proclaims innocence. The stolen item, a brooch, is replaced before the police visited. The maid is still fired, and a cheaper, better maid was hired. The two sisters, Lavinia and Emily whose household this is, have a strange dynamic as one of the sisters always requires help and it is implied that she’s a hypochondriac. They are new to the village. This is where the first hypothesis point is, just before the actual action takes place. The next hypothesis point includes the new information that the new maid has disappeared with a lot of stolen goods from the surrounding houses. The sisters give up their house and move to London. The conclusion is that this is work from serial thieves, the two sisters. Emily pretended to be ill

and thus was rarely seen, therefore able to pretend to be the new, perfect maid. All participants were either partially or fully correct.

4.2.1 Participant 2

Participant 2 was hesitant to fully commit to their hypotheses. Their language was full of uncertainty: “I’m still not too sure”, “I don’t know how yet”, “is this relevant to the story?”. Between their two hypotheses, the suspicion about the sisters was continued, although without making the connection between the maid and Emily. In the initial hypothesis, they become suspicious of the sisters due to how much “attention is paid to her and her ‘illness’”, as well as the fact they wanted to believe in the village maid’s innocence. In the later hypothesis, they noted how weird it was for the sisters to move to London after this incident, and therefore thought, again with language couched in uncertainty, the perfect maid and the sisters were working together.

4.2.2 Participant 3

Participant 3’s first hypothesis noted that the younger sister, Emily, was partly responsible. The participant covered opportunity and means, although they weren’t sure of the motive or what tied the perfect maid and Emily together. This connection, that the two are the same, was also missed within the second hypothesis although the suspicion continued that Emily and the perfect maid were responsible. This suspicion was extended to the other sister within this second hypothesis. This hypothesis focused mainly on figuring out motive and means. So, whilst the connection between the perfect maid and Emily was not made, enough of the evidence created suspicion against the sisters to cause Participant 3 to suspect the two sisters.

4.2.3 Participant 4

The structure of the hypotheses from the participant was similar to how the pilot participant laid out their working: both sets of hypotheses had an initial paragraph capturing some of the facts of the case. Participant 4 included some judgement, such as Emily “seems to be a hypochondriac”. Participant 4 immediately focused on motive and who benefited from the village maid being fired. This question of benefit was applied to both the new maid and the two sisters, which concluded with suspecting Lavinia, as an attempt to relieve the “strain of her duties” to her sister. The second hypothesis caught the subterfuge of Emily pretending to be the maid due to the show put on for Miss Marple: “Emily speaks, then Higgins leaves the room... We don’t see the two in the same room”. Another piece of evidence that caused more suspicion is that the two sisters are new to the village and have only stayed for two months. The physical differences between the new maid and Emily were stark enough that it caused more suspicion. The hypothesis was finished with the sisters as the guilty suspects.

4.3 *Peril at End House*

Peril at End House is a Poirot novel. He becomes involved in a mystery where a young woman, Nick, with a grand house but not a lot of money has had three mysterious attempts made on her life. There are three given hypothesis points within this novel, with the last point just before the denouement. Nick's cousin is murdered, her fiancé is killed in a crash, and another attempt is made on her life that puts Nick in the hospital. The denouement reveals that Nick faked the attempts on her life and killed her cousin to pretend that the secret fiancé of her cousin was hers; since he had a lot of money willed to him, she could save her house and secure her future. One participant came to the correct conclusion, although another came close in their initial hypothesis.

4.3.1 *Participant 2*

At the end of Participant 2's first hypothesis they asked, "Are we taking Nick as innocent?" but because they don't know what motive she could have, they dismissed this and did not consider it in their later hypotheses. The second hypothesis widened the pool of suspects by positing that Nick's friends are behind the first attempts due to benefitting from her will, but that the servants, Ellen and her husband, enacted the later murder attempts. Participant 2 noted that since only three chocolates were poisoned, the murderer "must be someone who knows what kind of chocolate Nick likes", and therefore be close or friendly with Nick. The participant observed that Freddie, Nick's friend, was being framed due to the use of cocaine that Freddie was known to use. There was also continued use of discourse about their reasoning. In the initial hypothesis, Participant 2 noted that a character had the clearest motive but devalued their statement with their awareness of the genre: "I doubt it since the one that seems the most likely is never the one to have committed the crime in crime novels".

4.3.2 *Participant 3*

Across all three hypotheses Participant 3 remained steadfast in their hypothesis that the servants were colluding with the Crofts to murder Nick. Initially, this suspicion was stimulated by Ellen's behaviour after a shooting, where she was clearly surprised that it wasn't Nick who was murdered. The motive remains relatively unclear, but Participant 3 did note there may be a grudge as Nick "pays Ellen and her husband very badly because she 'lets' them have their child with them". The case that Participant 3 built against the Crofts was similar in focus: how their actions were suspicious. Other characters were discussed: Vyse, Nick's cousin, and Challenger, a potential love interest, were both discussed in their possible motives and alibis. Hypothesis two continued to focus on the two identified parties, the servants and the Crofts, and Australian couple. Further evidence was identified as being more suspicious about the Crofts and Ellen. Challenger was also questioned, although Participant 3 didn't resolve any questions they had. In hypothesis three, due to a forged will, Participant 3 concluded "there is no point in forging a will unless they expect the person in question to die". The main point of discussion within this hypothesis was a new character being introduced as a suspect; Participant 3 weighed up whether this new character being a murderer made sense.

4.3.3 Participant 4

A gap in this data fortunately doesn't take away from the participant's hypotheses, as their second and third hypothesis appeared to be combined. Their first hypothesis started by looking for motive and concluded the house must be part of it. Nick's grandfather had a lot of money, and therefore it wouldn't be unreasonable to think he may have left gold bullion in the house. Participant 4 remarked on Nick's potential to have made this up herself; all these murder attempts cannot be corroborated apart from the cut brakes in her car, but she "hit a hedge 'luckily'". The first hypothesis ended with Participant 4 thinking Nick's cousin Vyse was the most likely suspect as he would inherit the house from Nick's will, although Nick's friends and Nick herself were noted as suspicious. Within the final hypothesis the motive of owning the house was continued with discussion about who would benefit from Nick's will going missing. The main reason Participant 4 continued to suspect Nick was the discrepancy between Nick's words in her love letters to Seton and her words to Poirot. When her brakes were cut, she was blasé and didn't care to know any of the technical details; within her love letters, "she was interested in the technical plane details". This apparent discrepancy in character led to the final paragraph where Participant 4 can be seen to have a lightbulb moment. The question remained of why Maggie, her cousin, was killed. Then, the connection slotted into place that Maggie and Nick share the same family name, Magdala: Nick pretended that Maggie's fiancé was hers since his will was left out simply to Magdala. Nick's motive of preserving the house and her future was just a matter of murdering Maggie and making herself appear the victim.

4.4 *Evil Under the Sun*

Evil Under the Sun is another Poirot novel, and centres around a woman, Arlena, who is being unfaithful to her husband and on the verge of ruining another marriage, before being strangled. This novel was given four hypothesis points. The end reveals how the man Arlena was having an affair with is the murderer, along with his wife. The murderers, Patrick and Christine Redfern, plant several suggestions and red herrings along the way to draw suspicion away from them, even going so far as to attempt to murder a teenager. One participant identified one of the murderers. This was the same story where the pilot participant also identified one of the murderers.

4.4.1 Participant 2

Participant 2 initially suspected Ken Marshall, Arlena's husband, murdered her because he was in love with Rosamond. Participant 2 reasons that Marshall's alibi could be faked; his motive was he would inherit from Arlena. This suspect pool broadened to include Rosamond as an accomplice in the next hypothesis. The murderer would need an accomplice since it appears impossible for a single person to do it. The suspect could have been lying about their alibis and yet their alibis were backed up by someone else; thus, an accomplice was the most likely answer. This suspicion was continued in later hypotheses; Participant 2 kept Marshall and Rosemond as the murderers, although noted there are incongruous pieces of information that didn't fit this theory, and the participant was therefore uncertain in their hypothesis.

4.4.2 Participant 3

Participant 3 did not commit to who may have murdered Arlena, but instead created a narrative of what happened: “Arlena went to meet her blackmailer, or believed she was [...], and was killed at the meetup point by another person”. This was continued in both the second and third hypothesis point: she was killed by a “third party” and later “killed by JN [a mysterious unknown figure] in a rage”. The initial hypothesis focused mainly on going through the different characters and ascertaining their possible motives and the strength of their alibis. Hypothesis two and three repeated this process but with a smaller cast of characters. Hypothesis four was where there was concrete mention of who the murderer could be within the given characters. Within each hypothesis there was a different suspect, which contrasted strongly with Participant 3’s efforts in the previous novel.

4.4.3 Participant 4

Gaps in the data meant that the first and third hypothesis had been missed. Participant 4 did, however, correctly guess one of the killers. The first hypothesis pointed towards Marshall, in part because he has a solid alibi for after his swim, but he could have murdered Arlena during his swim. Due to this doubt over what time Arlena was killed, Patrick Redfern could have been the murderer since Emily Brewster left after the two discovered the body. The blackmail that Christine mentions is placed both under suspicion, “[it] could be a story she makes up to point suspicion elsewhere” and investigated, “why would a blackmailer kill [Arlena]?”. Unlike in the other attempts made by Participant 4, this final hypothesis ends with uncertainty. They mention that Patrick is the killer plus an accomplice, due to the mounting evidence that this may be the work of serial killers. Participant 4 notes it could be Christine, or Brewster. There is also mention of the Gardeners, another couple, being potentially the murderers: “there is little to point towards them, which is certainly suspicious in and of itself”.

5. CONCLUSION

Conducting this exploratory study revealed some aspects of interest within the hypotheses of the participants. Some consistently reasoned their way to the truth, whilst others did not; for instance, some evidence and previous hypotheses were developed or dismissed in later hypotheses. More data is needed to bring this work into more focus and be able to generalise with the ways in which people hypothesise. A later iteration may include a single story but with many more participants to narrow the focus and find all the ways in which people hypothesise. This could reveal a standard, or lack thereof, in how laymen hypothesise. This exploratory study shows that there is potential in further researching hypothesis-making and people’s processes to doing so. This speculation is but a hypothesis in itself; in the end, this direction must be researched further to determine its worth.

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