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Influence of Character's Visual Style on Reader's Empathy on Sad Emotional Story (Case Study: Webtoon "Bingkai Titik")

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Abstract. Empathy plays an important role in story – reading experience, where it could help the reader to connect and understand the characters better. Today, storytelling could be found across media; webtoon is one of them. The increasing demand for using visual style to convey stories triggers the curiosity of, whether the variation of visual style affects empathic response in a sad emotional story. A between–participant experiment that involves 63 Indonesian webtoon/comics readers between the age of 16 – 29 was conducted. The stimuli are webtoons that have different visual styles (simplified, combination, and realistic) with the same story, background, color, and layout. The participants read the stimulus (given randomly) while being recorded in an online meeting, then fill out a questionnaire to measure the empathic and visual familiarity response. The results show that visual familiarity does predict empathy but showed that there's no significant difference in the empathic response between visual styles, although the combination style got the highest empathic response among the others. On the contrary, realistic style significantly produces higher visual familiarity. These findings confirm the hypothesis that using combination style in a sad emotional story is expected to produce a higher empathic response.

Keywords: *visual style, emotional story, empathy, webtoon, illustration*

1 Introduction

The decision–making process on a certain character's visual style to use in a media, plays a role in how the message or story is conveyed to the audience. Variations of visual style have different advantages and disadvantages [1]. Simplified styles tend to let the reader identifies with the character, for its lack of detail would make it easier for the reader to picture themselves as the character. This also explains the way we express ourselves in the form of smilies when texting or conversing on the internet [2] because we could fit the basic human characteristic into our own (two dots as eyes, and a mouth that resembles basic human characteristic). On the contrary, McCloud theorizes that a realistic style would give a clear distinction between characters and the reader. For realistic

style is more focused on the detail of the characters, how the character could be perceived as real, and how close it is to the human proportion. Between them, there is a combination style that combines the two characteristics of simplified and realistic. The combination style focuses on making the character looks believable (could exist in their own world), while also reducing the details of the characters, leaving space for the reader to identify themselves with the characters. Besides, combinations could also adopt the abstract–stylized aspect of the simplified style, so there would be a certain uniqueness that could make the style easier to distinguish from the others. Such as exaggeration of facial features (eyes, mouth, ears, etc), a certain type of line characteristic (using flowy or boxy lines), style of shading, etcetera.

McCloud's visual style theory explains that variations of style could be found across the triangle range of visual styles. Figure 1 explains that there are 3 points that make the visual style range. The bottom left corner is closer to reality such as realism portrait (there's photography, human, and reality outside the triangle), whereas the bottom right corner is closer to perceived – language (there are words, sentences, and language outside the triangle), and finally the picture plane on top of the range (abstractions). Character visual style in comics tends to use abstraction across the realism – simplified to make the illustration distinctive, such as drawing the nose with squiggly lines. That is why abstraction could be found whether it's simplified, combination, or realistic; the only difference is how much abstraction stylization it contains. These characteristics of the visual style raise the question, of whether they affect empathic response or not? Does visual familiarity affect empathic response too?

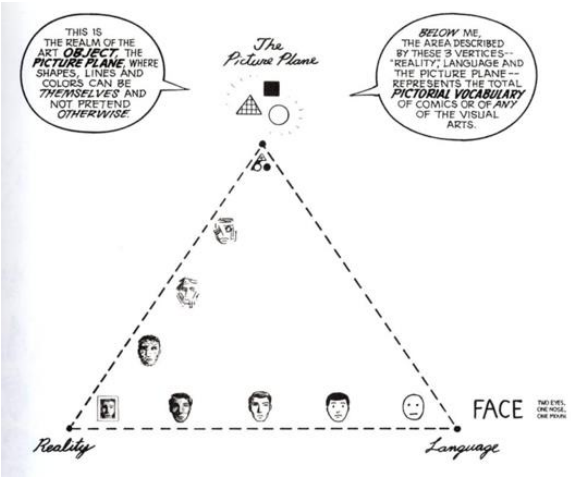

Figure 1 Scott McCloud's visual style range [1].

Empathy has been a part of human's daily lives; including our habits of consuming stories too. By definition, empathy is a series of constructions that explains how an individual responds to another person's experience [3], and that response could happen to a fictional character too. Though there are differences in empathy response to a character than it is to a human, the psychological process is similar [4]. Empathy in literature is needed for the reader so they can understand the character's perspective, reflect based on the situation the character is on, and build emotional involvement [5], [6]. That is why this research goal is to know how to utilize and optimize empathic response in story-based work using visual style.

Empathy could occur in diverse situations, whether positive or negative. But, empathy that emerges from a negative situation (problem, difficulties, etc) is argued to trigger higher involvement, fulfilled the criteria for empathy to occur, and could happen whether the reader has a similar experience or not [7]–[9]. Emotional stories could be found across genres too; it could be in drama, romance, action, or even horror. That is why this research focuses on sad emotional story as its control variable.

To get more specific, this research uses a case study of a webtoon called "Bingkai Titik". Webtoon is a digital comic format that has the characteristic of using up to down reading direction (long horizontal layout). Webtoons are usually read using a smartphone. A company called NAVER Webtoon is one of the leading ones in the industry, where there are approximately 72 million active users monthly [10]. There are around 38.2% Indonesian respondents that show interest in this platform and is the 4th highest country in the world that tends to pay to read in the platform [11]–[13]. The platform's webtoon is dominated by combination visual style across the genres. While realistic styles tend to be found in horror and action, and simplified styles in the slice-of-life genre.

"Bingkai Titik" is a comic in drama genre by Gabriel PT Dedi, that focuses on a family-themed sad emotional story. This comic is chosen to be the main stimuli because the story fits the theory of emotional story, which has situations that trigger emotion sensitivity, expressions that signal emotions, response and reaction to a certain situation, and the reaction of how the emotions felt like [14]. The reader's response in the comment section shows how they cried while reading the story because they have a similar experience. Also, this comic has been nominated as "Story of the year" in the POPCON Awards 2018. The comic uses combination visual style, that fits the need of this research. The full first arc of the story consists of 24 episodes, but this research only uses 3 episodes (18-20) because of limited time and budget to make the other stimuli. The 3 episodes tell the summary of the story and focus on the sad emotional story about death.

2 Research Methodology

This research aims to understand how much visual familiarity in simplified, combination, and realistic visual style affects empathy; also, to see the differences of each variable (familiarity and empathy) across the stimuli. Based on the goal of this study, three hypotheses are formed:

1. There is linear regression between visual familiarity and empathic response. Visual familiarity is predicted to affect empathic response in webtoon emotional story using simplified, combination, and realistic visual style.
2. Combination visual style produces a higher empathic response in webtoon emotional story, compares to simplified and realistic style.
3. Realistic visual style produces higher visual familiarity response in webtoon emotional story, compares to simplified and combination style.

This research limits the scope of visual style to character visual style only, while keeping the background, color, layout, gesture, and other elements the same. The primary theory used for visual style is Scott McCloud's visual theory. Visual styles used as stimuli are Simplified, combination, and realistic, as representations of each range.

2.1 Procedure

The experiment's procedure started by asking the participant candidates to fill out a pre-measurement questionnaire, in order to map the criteria such as age, webtoon / comic reading habits, and empathy score. Participants who fit the criteria then proceed to participate in the main experiment. The main experiment was conducted with 2 choices of method, synchronous and asynchronous. A synchronous experiment involves the participant reading a given stimulus, while being recorded in an online meeting (to capture the expression), then filling out the main questionnaire anonymously to measure the empathic and visual familiarity response. The asynchronous experiment was done by giving instructions to the participants, such as the links needed to read the webtoon and fill out the questionnaire, and ensuring the environment is suitable to conduct the experiment (alone, and in a silent condition without music or noises). The stimuli are randomly assigned to each participant, except for those who previously have read "Bingkai Titik", they're given the original visual style which is combination.

2.2 Stimuli

Based on the original work of Bingkai Titik (combination style), stimuli are designed to fit the simplified and realistic visual style range, while maintaining the gesture, background, and layout. Each style is designed based on the other references that fit McCloud's theory on visual style. All the visual style results could be seen in Figure 2. Simplified style is focused on simplifying the details of the characters, using simple form based on geometrical shapes (circles, squares, ovals, etc), while maintaining the characteristic and uniqueness of each character using abstract stylization and expression exaggeration. The realistic style focuses on enhancing the details of the original combination style, making it closer to human proportion to make a clear distinction between the characters. The original style of the webtoon, which is combination, got the simplified human characteristics, abstract stylization, and facial exaggeration; which fits the combination style characteristic. The original work does not include eyes when drawing the face. To keep it consistent, the simplified style does not use eyes too, but the realistic does because the point of realistic style is to bring it closer to human proportion and characteristics.

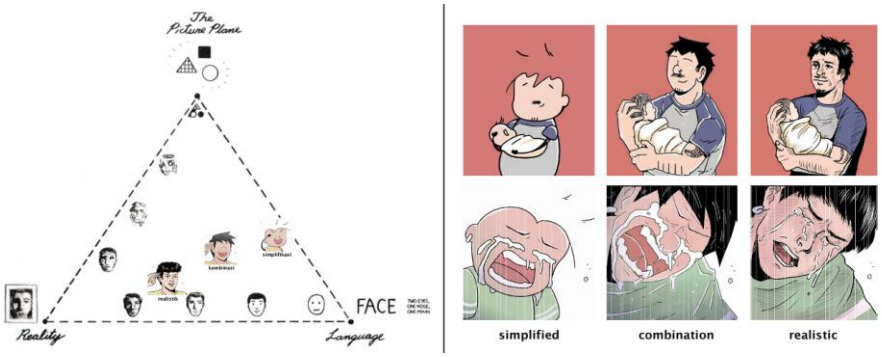

Figure 2 Stimuli comparison and range placement.

2.3 Participants

The participants of this experiment are webtoon readers from West Java and DKI Jakarta (n = 63; 25 male and 37 female; age ranges from 16 – 29). The criteria of the participants are based on the majority demographic of NAVER Webtoon readers in Indonesia. Having experience or habit of reading webtoons or comics would help the participants to understand the panel reading flow. A moderate-high empathy score would help optimize the empathic response to the webtoon. Participants' average experience in reading comic/manga / webtoon is 1 – 20 years, while also having a moderate-high empathy score.

2.4 Variables

The variables used in this research consist of 3 independent variables and 2 dependent variables. The three independent variables are variations of visual style, which are simplified, combination, and realistic. As for the control variable, it consists of an emotional story, layout, color, gesture, visual narrative, etc.

The two dependent variables are empathy and visual familiarity. 6 dimensions formed the empathy variable, such as Fantasy (EF), Perspective Taking (EP), Empathic Concern (EE), Character Identification (EC), Narrative Situation (EN), and Emotional Contagion (EEC). As for visual familiarity, there's only one dimension that measures that variable (V).

2.5 Instrument & Realibility

This research uses a quantitative questionnaire as the instrument to measure empathy and visual familiarity. The instrument was designed based on several existing questionnaires and theories, such as Interpersonal Reactivity Index [15], Emotional Contagion Scale [16], Uncanny Valley Scale [17], and narrative empathy theory [9]. There is a total of 36 items on the questionnaire (25 items for the empathy variable, 11 items for the visual familiarity variable), using the 0 (strongly disagree) – 4 (strongly agree) Likert scale as the measurement.

A reliability test using Cronbach Alpha was conducted for both variables. The data used for the test was retrieved from a pilot test that consist of 30 participants in total that fits the criteria (10 participants for each stimulus). The result shows that empathy variable's Cronbach alpha is considered high across the stimuli (simplified $\alpha = .910$, combination $\alpha = .955$, and realistic $\alpha = .833$). Several items could be removed to increase the reliability score, though since the overall score is considered high enough, and those items are considered important to measure the empathy score, then the items in question are only revised but not omitted from the questionnaire.

On the contrary, visual familiarity variable's alpha Cronbach value are considered low (simplified $\alpha = .594$, combination $\alpha = .853$, and realistic = .670). Upon further analysis, several items needed to be excluded to increase the alpha value across the stimuli, they're items number 26, 28, and 29 that has negative alpha scores. After removal, there's total 8 items in the visual familiarity variable, with simplified $\alpha = .746$, combination $\alpha = .878$, and realistic = .737. Other items that have relatively low alpha values are revised to increase the clarity of the statements.

Table 1 Summary of Cronbach Alpha's reliability test

Variable	α	Total Items	Description
Empathy (Simplified)	.910	25	Reliable
Empathy (Combination)	.955	25	Reliable
Empathy (Realistic)	.833	25	Reliable
Visual Familiarity (Simplified)	.594 (*.746)	11 (*8)	Reliable
Visual Familiarity (Combination)	.853 (*.878)	11 (*8)	Reliable
Visual Familiarity (Realistic)	.670 (*.737)	11 (*8)	Reliable

* Score and total item after the unreliable items are omitted from the questionnaire.

3 Result and Discussion

3.1.1 Visual Familiarity and Empathic Response Correlation Test

The data retrieved from the experiment are processed using IBM SPSS Statistics 26 to answer the hypotheses. A Pearson Correlation test and Linear Regression test was conducted to see how much visual familiarity predicted empathic response. The result on correlation test shows that there is correlation between visual familiarity and empathic response across the stimuli. Simplified style shows moderate correlation ($r = .582$, $n=21$, $p < .05$, 2 tailed), combination shows moderately high correlation ($r = .726$, $n=21$, $p < .05$, 2 tailed), and realistic shows moderate correlation ($r = .643$, $n=21$, $p < .05$, 2 tailed). After it's confirmed that there's correlation across the stimuli, then a regression analysis was conducted to see how much visual familiarity predicts empathic response. Regression analysis showed that 33.9% visual familiarity predicted empathic response in simplification style ($R^2= .339$, $F(1,19) = 9.745$, $p < 0.05$), while there's 52.8% in combination style ($R^2 = .726$, $F(1,19) = 21.23$, $p = .000$), and 41.3% on realistic ($R^2= .413$, $F(1,19) = 13.372$, $p = 0.002$).

Table 2 Summary of correlation and regression test.

Visual Style	R	R^2	Adjusted R^2	F
Simplified	.582	.339 (33.9%)	.304	9.745
Combination	.726	.528 (52.8%)	.503	21.226
Realistic	.643	.413 (41.3%)	.382	13.372
Total	.534	.285 (28.5%)	.273	24.282

3.1.2 Visual Familiarity and Empathic Response Correlation Result Discussion

The results indicate that there is a relatively moderate-high correlation between visual familiarity and empathy across the stimuli, thus the first hypothesis is supported. Correlation between the two variables is suspected to happen because of the cognitive aspect of empathy. The previous study found that race familiarity would affect how the brain processes empathy; when a person is used to communicate, interacting, or see with a diversity of race, they would produce a higher empathic response to other races [18]. This phenomenon is suspected to occur in visual style and empathy too, where the more reader exposed to a certain visual style, the more familiar they are, thus resulting in a higher empathy response. The result shows that familiarity with the combination style is expected to predict the highest empathic response than the other two styles; followed by realistic style, then simplified. Presumably, because combination style could be found in many media, for its characteristic allows it to use a lot of exaggeration and stylization in the design process.

3.1.3 Empathy and Visual Familiarity MANOVA Test

A MANOVA test was conducted to answer the second and third hypotheses. MANOVA was chosen for its advantages of avoiding type 1 error and presenting the comparison directly. The assumptions before conducting MANOVA are met, where the multivariate normality ($p < .05$) and Box's equality of variance ($p > .05$) are fulfilled. Also, Lavene's of equality of error variances test results both show p-value below 0.05 (empathy = .168, visual familiarity = .816). Thus, we'll be using the Bonferroni test when reading the MANOVA table. Wilk's lambda shows that there's a significant difference between the three IV groups ($F(4,118) = 14.63$, $p = .000$, Wilk's $\lambda = .447$).

Table 3 Summary of MANOVA between – subjects' effects.

Source	Dependent Variable	df	Mean Square	F	Sig.	η_p^2
Factor	MeanTotalE	2	.328	.915	.406	.30
	MeanTotalV	2	4.377	25.123	.000	.456

The between – subjects' effects shows that there's no difference across stimuli for empathy variable $F(2,60)=.915$, $p > .05$, $\eta_p^2 = .30$). On the contrary, there is significant different in visual familiarity variable ($F(2,60)=25.12$, $p < .05$, $\eta_p^2 = .456$). This shows that between the three stimuli, there's not too much difference in the empathy variable, and that result might show because of other variables, not the experiment. This topic will be discussed in detail later.

Table 4 Summary of post – hoc test (Bonferroni)

DV	(I) Factor	(J) Factor	Mean Difference (I-J)	Sig.	95% Confidence Interval	
					Lower	Upper
Empathy	Simplified	Combination	-.2019	.837	-.6570	.2532
		Realistic	.0267	1.000	-.4284	.4818
	Combination	Realistic	.2286	.663	-.2265	.6837
Visual Familiarity	Simplified	Combination	-.5281*	.000	-.8454	-.2109
		Realistic	-.9091*	.000	-1.2263	-.5918
	Combination	Realistic	-.3810*	.013	-.6982	-.0637

Benferroni's post – hoc test result shows a detailed comparison between variables and stimuli. Since there are 2 variables, we use the α at .025. In line with the MANOVA test, the empathy variable does not have a significant difference across variables, where the p values > .025 with positive upper values on confidence interval (CI). Whereas visual familiarity's p-value < .025 with negative lower and upper values indicates a significant difference across the stimuli combination.

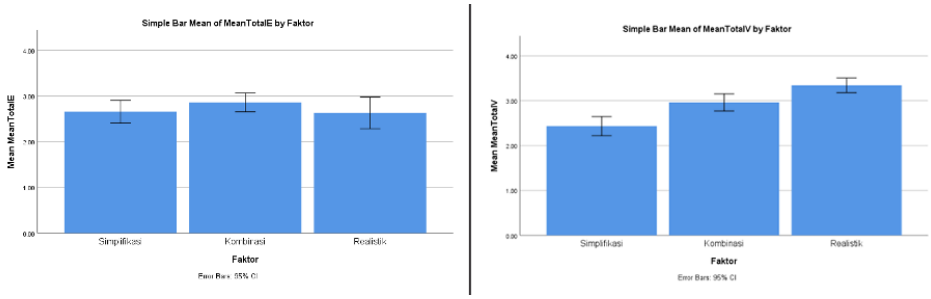

Figure 3 Mean difference between stimuli (empathy on the left, visual familiarity on the right)

3.1.4 Empathy and Visual Familiarity Result Discussion

Although the result shows that there is no significant difference in empathy, combination's mean score is higher than the other visual style. This means, the second hypothesis which says that combination produces a higher empathy response is supported, though not significantly. The causes of non – significant results presumably come from another variable that wasn't considered in the experiment. Those variables such as similar past experience, uneven story context to each participant, experience of reading story that includes metaphors,

inconsistency of using eyes across stimuli, and experience of reading silent comics.

Similar past experience are proven to affect the effort of perspective-taking, which is a part of measuring empathy [19]. From a narrative empathy perspective, having a similar emotion response or experience would result in higher empathy [9]. That is why, the dissimilarity between the participants is suspected to be one of the reasons of non – significant results in empathy variable. Besides that, some of the combination style stimuli were given to the participants that have read Bingkai Titik previously. This variable is also suspected to affect the results, because those who've read the full story (24 episodes) would get more context, and know the character better, than those who read only the stimuli, which is 3 episodes only. This assumption is supported by the participant's comments such as "it would be better if I could get to know the characters first before reading the sad part" or "I'm confused about the playing with dirt (metaphor)", where those points are told in the full 24 episodes.

Inconsistency of eyes usage across the stimuli is also assumed to be one of the reasons too. The realistic style is the only one that uses eyes on the characters. Eyes are considered to be one of the facial features that could express thoughts or emotions [20], while in painting they could also simulate the effect of gaze or looking in the mirror [21], [22]. That is why the inconsistency is suspected to result in non – significant results too. Lastly, another variable that is considered to affect the result is the experience of reading a silent comic. Silent comics are comics that do not use text to tell a story, it focuses on visual narrative to optimize the storytelling. Some participants expressed that they were surprised that they could somehow understand the story without text, while still confused at some parts of the story.

The fantasy dimension which is used to see how the reader could transport themselves to the story as the character (similar to immersive experience), shows that combination ($r = 2.87$), realistic ($r = 2.85$), and simplified ($r = 2.79$) does not affect fantasy dimension too much since the mean score is not that different. Though combination got the highest score presumably because of its similar visual style to the background (since it's the original) and simplified facial features to make it easier for the reader to look at the character as themselves. Perspective-taking dimension shows the reader's ability to understand the character by looking from their perspective. The mean difference shows that simplified ($r = 2.88$) have lower score than combination ($r = 3.11$), and realistic ($r = 3.04$). It is assumed that the characteristic of combination and realistic (a similar proportion to the human body) and visual familiarity affects positively to the score. As simplified style reducts a lot of detail from human proportion by using simple geometrical shapes. The empathic concern dimension shows the

reader's empathic response to the character who's going through a difficult situation. Result shows that combination (r = 3.17) got higher mean score than simplified r = 2.87) and realistic (r = 2.85). Familiarity and exaggeration of expression are assumed to influence the result. Combination style got the familiarity from a lot of exposure of style usage around the media and the similarity to human proportion, while still being able to add characteristics to the stylization and exaggerating the emotions so that readers would feel how's the character feeling. Those are the dimensions based on Davis' empathy scale (IRI). The total mean from those 3 dimensions shows that combination (r = 3.06) got the highest score, while realistic (r = 2.90) and simplified (r = 2.85) are lower than combination. The results aligned with the MANOVA result where combination scores were higher in total – empathy scores.

For character identification dimension there is no significant difference between simplified (r = 2.49), combination (r = 2.4), and realistic (r = 2.22). Though, simplified got the highest score is expected based on McCloud's theory, where the advantage of simplified style is being able to leave room for the readers to project themselves to the characters. The narrative situation dimension aims to measure the familiarity of the reader with the location, narration structure, behavior, etc. result shows that combination (r = 2.98) got the highest mean score than simplified (r = 2.56) and realistic (r = 2.67). It is assumed that combination character style fits with the background style resulting in the combination style score highest than both styles. Familiarity with the narration type and personal experience is expected to affect the score too. Lastly, on the empathy variable, emotional contagion aims to measure how much emotions the character is feeling is being transferred to the reader. Result shows that combination (r = 2.80) score higher than realistic (r = 2.24) and simplified (r = 2.29). It is suspected that exaggeration plays a role in emotional contagion. That's the reason why combination scored higher than the rest since there's a lot of exaggeration in that style. It was mentioned that participants are being recorded while reading the webtoon. The recording shows that there isn't much of a facial movement in some respondents, only subtle eyebrows movement. Though, for the more expressive person, there is verbal and huge movement in the expression while the characters are crying or when something shocking happened. This shows that emotional contagion does occur moderately based on the recording.

Visual familiarity shows a significant difference between stimuli. Realistic (r = 3.43) score highest than the rest, followed by combination (r = 3.20), then simplified (r = 2.76). This result proves McCloud's point around how the closer it is to picture / realism, the easier it gets for the information to be received. On the other hand, the closer it is to language or text (simplified), the more effort is needed to perceive the information. That is why realistic visual style scores highest in familiarity since it is easier to receive the detailed image of the

character. Whereas simplified style requires the reader to perceive and fill between the gaps of simplified proportion. Since combination style includes both realistic and simplified characteristics, this also explains why it produces higher mean scores than simplified.

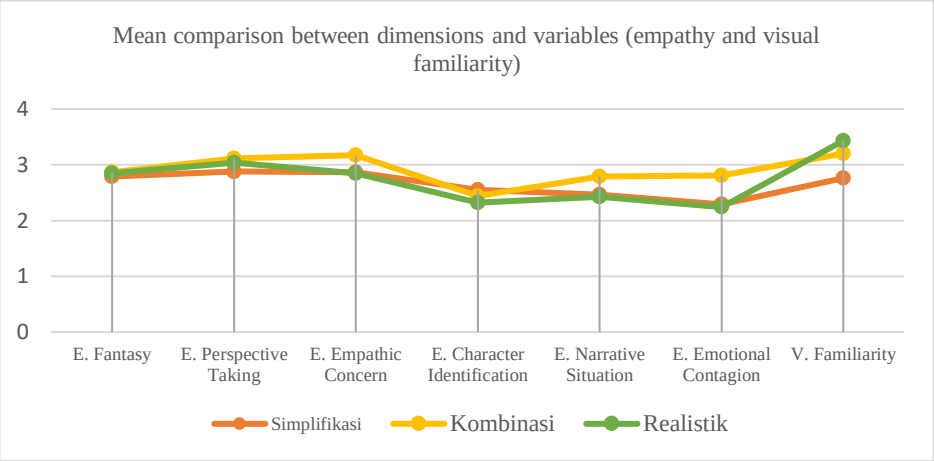

Figure 4 Mean comparison between dimensions and variables (empathy and visual familiarity).

4 Conclusions and Limitations

This research aims to understand human's empathic response towards the variation of visual style in sad emotional story webtoon. It is found that there is a correlation between visual familiarity and empathic response across the stimuli. The cognitive part of empathy is one of the suspected reasons that explain the correlation between both variables since prior study shows that familiarity with a certain race would affect empathy. Combination shows the highest power in how familiarity predicted empathy than the other style. It's suspected that the usage of combination style across media affects familiarity since combination's abstract stylization and exaggeration characteristic makes it flexible to use.

There is no significant difference in empathy variables across stimuli. It's suspected that other variables affect this result, such as similar past experience, uneven story context to each participant, experience of reading story that includes metaphors, inconsistency of using eyes across stimuli, and experience of reading silent comics. Even though there is no significant difference, the combination style score is higher than simplified and realistic. Using combination style in a sad emotional story is expected to increase empathy response.

Across stimuli, there is a significant difference for visual familiarity, where realistic scores are the highest, followed by combination, then simplified. This finding explains McCloud's theory even further, where realistic images would be easier to process because it's a received information. Where languages or text (the extreme point for simplified style) would require more effort to process because it's a perceived information.

Based on those findings, a combination visual style is argued to be the most suitable for sad emotional story webtoon to induce an empathic response, for its characteristic is a collaboration between the advantages of simplified and realistic. Simplified characteristics such as leaving room for the reader to identify themselves with the character/image by simplifying human proportion, expression or proportion exaggeration, also abstraction stylization. Combined with realistic characteristic that increases familiarity from its closeness to human proportion and likeness.

For further research about visual illustration and empathic response, it's recommended to look more into variables that could affect the result of the experiment, then put even more specific criteria for experiment participants. In designing the stimuli, it is recommended to use even more extreme comparison, so that the result would differ significantly.

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