

**Empathy and Emotions in the Filmic Experience: The Influence of Narrative Complexity
and Visual Film Style**

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Abstract

Empathic and emotional engagement play an intrinsic role in art, with film being no exception. Research indicates that viewers empathically and emotionally engage with the characters they see on screen, however information regarding how different film elements influence these relationships remains limited. Some theories suggest both uncertainty while watching films as well as film's visual style as relevant variables to consider. The goal of the present study was to explore a gap in the current research in regards to how narrative complexity and film style (i.e. animation vs. live action) influence the affective empathy and emotional intensity felt by participants. To analyze these relationships, we conducted an experiment in which 34 participants watched six short films and subsequently answered a questionnaire regarding their experience of each film. While narrative complexity was not found to be significantly related to affective empathy, results demonstrated that it is significantly related to emotional intensity. As for film style, the films being either animation or live-action demonstrated no significant influence on either affective empathy nor emotional intensity. More elaborate and controlled research designs to study the effects of both narrative complexity and film style are recommended.

Keywords: narrative complexity, animation versus live action, affective empathy, emotional intensity

Empathy and Emotions in the Filmic Experience: The Influence of Narrative Complexity and Visual Film Style

Both art and empathy play an intrinsic role in human society and evolution. The current conceptualization of empathy has its origins in the discussion of artistic experience (Gernot et al., 2018), allowing spectators to become emotionally in touch with artistic objects. Empathy is defined as the sharing of affect, wherein individuals are able to understand the emotions of others (Keen, 2006). An emotion is a mental state that can be accompanied by various feelings, physiological arousal and action tendencies (Plantinga, 2009). Emotions vary in intensity, which also holds true for the emotions individuals experience when empathetically engaging with artworks. Concerning empathy, emotions are both cognitively and affectively understood, with the affective component involving the adoption of another's emotional state (Coplan, 2004). Research specifically analyzing the affective component of empathy in relation to art is minimal, thus most research discussed below will refer to the general conceptualisation of empathy. Nonetheless, empathy appears to play an intrinsic role in spectators' responses to art. When viewing a work of art, spectators often connect with what is represented, such that a work of art can bring particular emotions to consciousness (Green, 2008).

Moreover, empathy as a whole is dependent upon both trait capacities and state influences (Lyu et al., 2022). Where trait empathy refers to the more general and global ability to feel empathy, state empathy refers to one's reaction to specific situations. Notably, some have suggested that arts can be used to promote empathy and prosocial behaviors in a trait capacity. For instance, one study found that arts engagement was positively associated with empathy (Kou et al., 2019). Another study conducted by Ahmadzadeh et al. (2019) found that films successfully improved participants' empathy levels due to their ability to emotionally engage individuals with

the presented story and characters. Thus, art appears to be a relevant tool for increasing people's empathy in general, also beyond the context of the artwork by itself.

On top of eliciting trait-level empathy capacities, the arts also elicit more immediate and specific empathetic responses. In regards to film in particular, viewers are able to adopt the emotional states of characters, resonating with characters' emotions and relating them back to their own lived experiences. The emotions displayed on screen activate the emotional knowledge of viewers, enabling their resonance with the feelings of the characters (Green, 2008).

Furthermore, viewers create bonds with the fictional characters they see on screen, facilitating emotional processing (Hamilton, 2023). Films are particularly effective in emotionally engaging viewers due to their presentation of moving bodies and faces, activating strong empathic responses in relation to characters' situations (Jaén Portillo, 2024). Facial expressions and moving bodies provide emotional cues for viewers to reflect on and understand, absorbing viewers into the emotional world of the film.

The ability of films to stimulate feelings within the audience is further demonstrated by how representations in film activate mirror neurons (Keen, 2006). When looking at others, we resonate with their actions through the activation of our own motor neurons, demonstrating how our empathic responses to others are reflected in brain activity. While this activation occurs in our daily lives, it is also related to our empathic engagement with films, as viewers resonate with the experiences displayed on screen and share in the emotions of the characters and their situations (Grodal & Kramer, 2010). Hence, films activate viewers' ability to feel with others, encouraging emotional and empathic engagement. With this in mind, different film elements may alter viewers' emotional and empathic experiences.

One such film element is the degree of narrative complexity. As a whole, narratives play an important role in our sense of identity and culture (Davies, 2009), aiding in our emotional resonance with fictional worlds and characters. Complex, “mind game” or “puzzle” films use a number of unconventional storytelling techniques, including multilinear, fractal, episodic, alternative plots and multiform narratives (Kiss & Willemsen, 2017). Their deviation from common narrative formulas interferes with viewers’ reliance on typical story schemas, thus posing a cognitive challenge to viewers. As a result, viewers’ sense of coherence is disrupted, prompting them to analyze the films as they attempt to establish a comprehensive understanding. The confusion and uncertainty aroused by complexity encourages active viewership, where individuals may piece together their own interpretations and meanings. With the influx of complex films since the mid-90s (Kiss & Willemsen, 2017), viewers are able to actively engage with complex emotional, psychological, and philosophical ideas. Thus, viewers are absorbed into puzzling new realities that have the potential to incite strong emotions through their destabilization of familiarity.

Consequently, different film narratives can elicit different emotions and empathetic involvement. As such, puzzling films in particular, with their complex and often confusing narratives, may influence viewers’ empathetic responses. These types of narratives generate feelings of uncertainty within viewers, which has the potential to intensify their affective reactions. For instance, a study by Bar-Anan et al. (2009) found that participants who uttered feelings of uncertainty while watching a film rated the positive clips more positively and the negative clips more negatively. These results are further corroborated by a study that found that uncertainty during film viewership led to the intensification of both negative and positive affective states (Anderson et al., 2019). The mental simulation created by uncertainty can result

in emotional experiences, as participants' curiosity leads to greater psychological engagement and identification with the characters. Thus, the uncertainty triggered by complex narratives has the potential to intensify emotional involvement. Additionally, complex narratives may immerse viewers as they become motivated to spend more time in understanding them. For instance, achronological stories were found to elicit greater interest and enjoyment in films, as well as elicit more emotions (Huang & Grizzard, 2022). This greater engagement could further influence viewers' connections to characters, increasing their empathy responses.

Beyond narrative complexity, there are a number of filmic qualities that affect viewer's experiences, including the use of live action vs. animated visuals. Within film scholarship, the exact definition of animation is contested due to the broadness of the term and its common oversimplification. It typically encompasses a number of different film styles, ranging from stop-motion animation to traditional animation to digital animation (Greenberg, 2011). What unites these varying styles is the illusions of movement they create, as opposed to the practice of directly filming the world around us. In its various forms, animation has the ability to easily create new worlds, in which the logic and rules of physical reality are transformed and often destabilized (Buchan, 2014). On this basis, animation is able to "harvest reality" (Llamas-Rodriguez, 2023, p. 103), actualizing unique and original ways of seeing the world. In its presentation of unfamiliar realities, animation can cognitively challenge viewers in a similar fashion to complex narratives. With both animation and complex narratives, viewers' typical perceptions and cognitive schemas are questioned, as their coherent understandings of the world are destabilized and transformed into worlds of uncertainty and unfamiliarity. The audience is thus confronted and challenged with uncertainty, forced to reconsider their familiar reality. As mentioned above, this confrontation with uncertainty can intensify viewers' emotions (Anderson

et al., 2019; Bar-Anan et al., 2009). This intensification of emotion can thus manifest into increased identification with the characters, further impacting viewers' level of affective empathy.

Moreover, animation may be particularly useful in generating empathy as a result of its expressive qualities. Animation's affordances allow for the exploration of character's inner states, imaginatively showcasing their desires, thoughts and feelings (Piepiórka, 2021). Previously hidden inner states can now be visualized and shared, far beyond what is capable in live-action films (Wells, 1998). This opportunity to be a part of a character's inner world can foster empathy, as the audience is more closely connected to the emotions of the film. Additionally, the emotional expressiveness that animators imbue their animated characters with provides them a strong sense of life (Jenkins, 2013). The exaggerated expressions of these characters absorb and attract viewers. As Disney animators Frank Thomas and Ollie Johnston have stated, "the audiences will make our little cartoon character sad—actually far sadder than we could ever draw him—because in their mind that character is real. He lives in their imaginations" (Jenkins, 2013, p. 585). Thus, animation in film may be particularly effective in fostering empathy by way of more directly and imaginatively connecting viewers to character's feelings beyond what is typically achieved in live-action films.

With the above in mind, it is relevant to consider how narrative complexity and film style operate in tandem to affect empathy and emotional resonance. For instance, both the use of complex narratives and animation allow for an exploration of alternative realities that cognitively challenge viewers. In doing so, they may engage viewers more with the characters, enhancing their emotional responses. With the ever-increasing influx of technology and information, complex narratives and animation offer a means to reflect the complexities of modern life. These

explorations of a more complex understanding of life may thus foster connections with viewers, as they are encouraged to investigate and challenge their own perceptions and preconceived notions. Through this active engagement, viewers may become more emotionally invested in the film, allowing them to empathize more with the characters. Animation in particular, with its propensity towards visualizing the inner lives of its characters, may enhance the effects of narrative complexity. Where narrative complexity creates uncertainty in the viewer that may intensify their emotions, animation may further deepen this relationship through its ability to imaginatively explore characters' feelings. As a result, viewers' feelings with the characters can be strengthened, further fostering empathy.

Our Study

The purpose of this study is to contribute to research on how particular filmic qualities foster viewers' empathic and emotional engagement. This study will contribute to the current research about empathy by focusing specifically on the component of affective empathy. Additionally, since affective empathy has to do with sharing another's feelings (Shen, 2010), emotional resonance plays an intrinsic role in empathy. As these are interconnected concepts, it is relevant to consider how they may follow similar patterns. Emotional resonance will be studied by examining the intensity of the emotions felt by participants. Correspondingly, I will look at the outcomes of both affective empathy and emotional intensity. Moreover, both narrative complexity and film style remain relatively untouched areas of arts research, with this study acting as a new exploration into how these two factors may influence viewers' experience.

To investigate these variables, we selected a set of short films and measured participants' perceived narrative complexity, their level of affective empathy as well as their emotional resonance with each film. The aim of the present study is to assess the interacting role of film

style (i.e. animation vs. live action) on narrative complexity and viewers' affective empathy as well as their emotional resonance in terms of the intensity of what they felt. I hypothesize that the perceived complexity of narratives alters both participants' levels of affective empathy as well as their emotional intensity. Films with narratives that are perceived as complex could increase participants' sharing and understanding of a character's emotions, while also increasing the intensity of the emotions they feel during the film. Additionally, film style (i.e. animation vs. live action) could affect the strength of each of these relationships, for instance by way of animation's imaginative capabilities.

Methods

Participants

For the present study, 34 students from the University of Groningen and Hanze University of Applied Sciences participated in exchange for Sona (Sona Systems, n.d.) credits or a voucher. One entry was discarded due to lack of data provided in Qualtrics (Qualtrics, Provo, UT), while another was discarded due to the participant dropping out of their programme shortly before the study. Of the participants, 61.8% identified as female and 38.2% identified as male. Majority of the participants (94.1%) were between the ages of 18 and 25, with 5.9% being above 25. Most of the students were in the Bachelor's Psychology programme (79.4%), while the rest studied varying Bachelor's and Master's programmes (20.6%). This study was conducted with approval of the ethics committee of the Faculty of Behavioural and Social Sciences at the University of Groningen and all participants provided informed consent.

Measurements/Materials

The full list of materials used for this study can be found in Table A1. For this paper, two questionnaires were used. In addition to these questionnaires, we collected information about

participants' gender, age, study, film watching experience and film preferences (see Appendix A for all items used).

Short Films

For this study, we selected six short films for the participants to watch (see Table 1). When selecting short films, we controlled for the duration of the short film (5 to 15 mins) and the genre (horror, thriller, sci-fi). Besides that, we balanced the number of animation and live-action films by using two animation short films and four live-action short films. Lastly, we balanced language-based and non-language-based short films and chose short films that focused on one main character.

Table 1
Information Regarding the Short Films

Title	CC	FS	Genre	Length (min)	Year
Alma (Blaas, 2009)	Linear	Animation	Horror	05:30	2009
Dirty Machines - "The End of History" (Olsom, 2020)	Linear	Live-action	Mystery/Sci-Fi	13:34	2020
Mouse X (Tagg, 2014)	Complex	Live-action	Mystery/Sci-Fi	15:05	2014
Opal (Stauber, 2020)	Complex	Animation	Horror	12:30	2020

Title	CC	FS	Genre	Length (min)	Year
The Ballerina (Fradkin, 2021)	Linear	Live-action	Thriller	07:45	2021
The Interview (Roper, 2019)	Complex	Live-action	Thriller	09:34	2020

Note. CC = Complexity Categorization, FS = Film Style

Perceived Narrative Complexity

Complex narratives are characterized by their use of unconventional storytelling techniques, which often confuse and cognitively challenge viewers (Kiss & Willemsen, 2017). To measure this, we asked participants to rate the complexity of each short film on a scale of 1 to 100 (see Appendix A). We then calculated the mean ratings for each film and categorized them as either linear (≤ 50) or complex (> 50).

Affective Empathy

Affective empathy involves sharing and understanding another's emotional state (Coplan, 2004). One tool used to measure affective empathy is the Empathy State Scale (Shen, 2010), which is a self report questionnaire with 12 items. It measures state empathy in message processing through three subscales, including Affective Empathy, as well as Cognitive Empathy and Associative Empathy. Items are rated on a 7-point Likert scale from strongly disagree to strongly agree. For this study, two items were chosen from the Affective Empathy subscale ("I experienced the same emotions as the character when watching this film"; "I can feel the

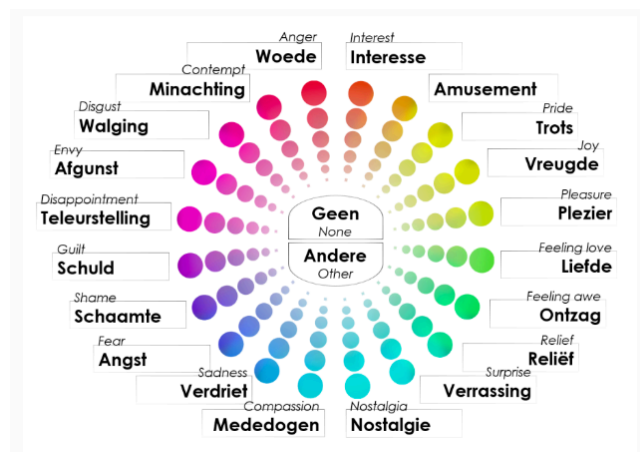
character's emotions"). The affective empathy score was calculated as an average of the participants' ratings for the films in the categories of complex or linear. In regards to the reliability, the affective empathy items demonstrated a reliability of $\alpha = .665$.

Emotional Intensity

Emotional intensity refers to how strongly participants felt their emotions during film viewership. The Geneva Emotion Wheel (GEW; Tinio & Gartsus, 2018) is a self-report instrument that presents 20 emotions with five intensity levels in a circular diagram (see Figure 1). After engaging with an artwork, participants can choose from the set of available emotions, such as anger, pleasure, surprise, etc. In addition to this, they can rate their chosen emotion on how intensely they felt this emotion; the larger the circle and the closer to the periphery indicates higher intensity. The response options of "no emotion" or "other emotion" are also available. For each film, participants provided two intensity scores, of which the higher of the two scores was used in the analysis. Furthermore, a procedure by Coyne et al. (2020) was followed, where the results from each film were averaged according to their respective category of linear or complex. This yielded emotional intensity scores rated on a scale from 0 to 1, with 0 indicating low intensity and 1 indicating high intensity.

Figure 1

The Geneva Emotion Wheel (GEW; Tinio & Garts, 2018)



Procedure

We used a convenience sampling procedure, in which participants were recruited via the social networks of the researchers, as well as through targeted advertisements on the Sona website (Sona Systems, n.d.) for undergraduate psychology students at the University of Groningen. The data was collected from April 23rd 2024 to May 10th 2024. Every session lasted approximately 90 minutes. Team members were present in the room for guidance throughout the whole experiment.

Upon their arrival at the laboratory, individuals who had not done so online provided written consent for participation in the study. Afterward, they sat in front of a large screen at a distance of 210 cm. A camera placed in front of the screen recorded their full-body motion and they were provided a tablet to use for the duration of the experiment. They then watched a selection of six short films (see Table 1), with a 5 min intermission break halfway through. The order in which the short films were presented was randomized. After each film, participants

filled out a Qualtrics questionnaire (Qualtrics, Provo, UT), where they firstly engaged in a free-writing procedure regarding their experience, feelings and thoughts of the film for 1 min. Then, they answered questions about their emotional experience, empathy, immersion, cognitive stimulation and bodily sensations. Finally, at the end of the study, they completed a questionnaire about their demographic information.

Design

This paper was part of a larger study conducted by a group of Bachelor psychology students. A variety of variables were studied using a repeated-measures design. The factor had two levels based on *narrative complexity* (linear vs. complex). With this design, we explored how these two levels of narrative complexity interacted with different outcome variables on each individual. Most of the outcome variables were measured through questionnaires, with the exception of *bodily engagement* which was assessed through movement energy analysis and *artistic experience*, which was assessed through a thematic analysis of a free-writing procedure. The outcome variables researched in this study include *artistic experience*, specific aesthetic experiences (i.e. *immersion*, *cognitive stimulation*), and subjective feelings (i.e. *emotional intensity*, *bodily sensations*, *cognitive empathy*, *affective empathy*). Next to that, the influences of *gender identity*, *personality (extraversion)* and *film style (live-action vs. animation)* were studied. Additionally, *bodily engagement* was studied as a mediating variable. The variables *gender identity* and *personality* acted as a between-subject factor. The variables *artistic experiences*, *immersion*, *cognitive stimulation*, *emotional resonance*, *bodily sensations*, *bodily engagement*, *cognitive empathy*, *affective empathy*, *subjective experience*, and *film style* were within-subject factors.

For my paper, I will focus on the influence of *narrative complexity*, in terms of linear vs. complex films, and *film style*, in terms of animated vs. live action films. These will both be studied in relation to the outcome variables of *affective empathy* as well as *emotional intensity*, which were measured through questionnaires.

Statistical analysis

My main analysis involved a Wilcoxon Signed-Rank test and a Friedman's test. The independent variable (IV1) is *narrative complexity*, which has two levels (linear and complex). The dependent variables are *affective empathy* (DV1) and *emotional intensity* (DV2). Additionally, I analyzed the influence of *film style* (i.e. animation vs. live action) (IV2) by comparing its effects in both the linear and complex categories of films. Firstly, I calculated the descriptives and averages for all of the variables. I then used the Wilcoxon Signed-Rank to test the differences between the following film categorisations: linear vs. complex, linear animation (LA) vs. linear live-action (LLA) and complex animation (CA) vs. complex live-action (CLA). Lastly, I used Friedman's test to compare the categories of LA, LLA, CA and CLA.

Results

My first hypothesis was that complex narratives would increase participants' level of affective empathy. My second hypothesis was that complexity would intensify the emotions felt by participants. Lastly, I hypothesized that animated films would further increase the effects of these relationships.

Assumption Checks

According to both QQ plots and results from the Shapiro-Wilk test, the scores from both affective empathy ($W(168) = .960, p < .001$) and emotional intensity ($W(168) = .858, p < .001$) were not normally distributed (see Appendix B for normality plots). As such, I chose to use the

non-parametric forms of a paired t-test and Repeated-Measures ANOVA, which are the Wilcoxon Signed-Rank test and Friedman's test, to ensure higher accuracy of my results.

Descriptive Statistics

In terms of film complexity, films were categorized based on participants' ratings of their complexity. Films that had a rating of ≤ 50 were placed in the linear category, whereas films with a rating of > 50 were placed in the complex category. Notably, I placed film 2 in the linear category despite its mean rating due to its closeness to the center as well as our agreement as researchers that it is more appropriate in the linear category. Table 2 shows participants' mean ratings for their perceived complexity, as well as the affective empathy and emotional intensity scores for each film.

Table 2

Averages of Perceived Complexity Ratings, Affective Empathy Scores and Emotional Intensity Scores for the Short Films

Film	FS	PC	CC	AE	EI
		<i>M (SD)</i>		<i>Mdn (IQR)</i>	<i>Mdn (IQR)</i>
1. Alma (Blaas, 2009)	Animation	30.00 (23.79)	Linear	4.182 (1.50)	.639 (.30)
2. Dirty Machines: The End of History (Olsom, 2020)	Live-Action	50.83 (25.61)	Linear	4.333 (2.00)	.626 (.28)
3. Mouse X (Tagg, 2014)	Live-Action	65.71 (22.38)	Complex	4.318 (2.00)	.632 (.45)
4. Opal (Stauber, 2020)	Animation	64.46 (25.43)	Complex	4.000 (2.50)	.635 (.30)
5. The Ballerina (Fradkin, 2021)	Live-Action	39.89 (23.61)	Linear	4.800 (2.00)	.716 (.43)
6. The Interview (Roper, 2019)	Live-Action	58.86 (22.74)	Complex	5.208 (1.50)	.544 (.28)

Note. FS = Film Style, PC = Perceived Complexity, CC = Complexity Categorisation, AE = Affective Empathy, EI = Emotional Intensity

With these ratings in mind, films 1, 5 and 2 were grouped into the linear category and films 3, 4 and 6 were grouped into the complex category. For emotional intensity, it's important to note that six entries were deleted due to inadequate indications of the intensity level. The linear films had an average affective empathy score of $Mdn = 4.333$ and an average emotional intensity score of $Mdn = .657$. By contrast, the complex films had an average affective empathy score of $Mdn = 4.417$ and an average emotional intensity score of $Mdn = .583$.

Main analysis

Narrative Complexity

To analyze the differences between the complexity categories concerning both affective empathy and emotional intensity, the average scores of the linear vs. complex films were compared, which displayed no significant differences for affective empathy ($z = -.269$, $p = .788$). Conversely, a significant effect was found for emotional intensity ($z = -2.049$, $p = .040$), indicating that the linear films had a higher average emotional intensity than the complex films.

Film Style

Furthermore, within the categories of linear and complex films, I analyzed whether film style (i.e. animation vs. live action) had any influence. For the linear films, film style displayed no significant difference over either affective empathy ($z = -1.341$, $p = .180$) nor emotional intensity ($z = -.569$, $p = .569$). The same was found for the complex films (affective empathy: $z = -1.510$, $p = .131$; emotional intensity: $z = -.911$, $p = .362$).

Lastly, I compared all of the scores based on the groupings of both complex vs. linear as well as animation vs. live action. LA includes the scores of film 1, LLA the scores of films 5 and 2, CA the scores of film 4 and CLA the scores of films 3 and 6. Overall, no significant difference was found between these groups for affective empathy ($X^2(3) = 3.676, p = .299$) nor emotional intensity ($X^2(3) = 5.871, p = .118$). Figure 2 and Figure 3 show the affective empathy and emotional intensity ratings for these groups respectively, and Table 3 the results from the Wilcoxon Signed-Rank tests and Friedman's test.

Figure 2

Changes in Affective Empathy (AE) Based on Groupings of Narrative Complexity and Film Style

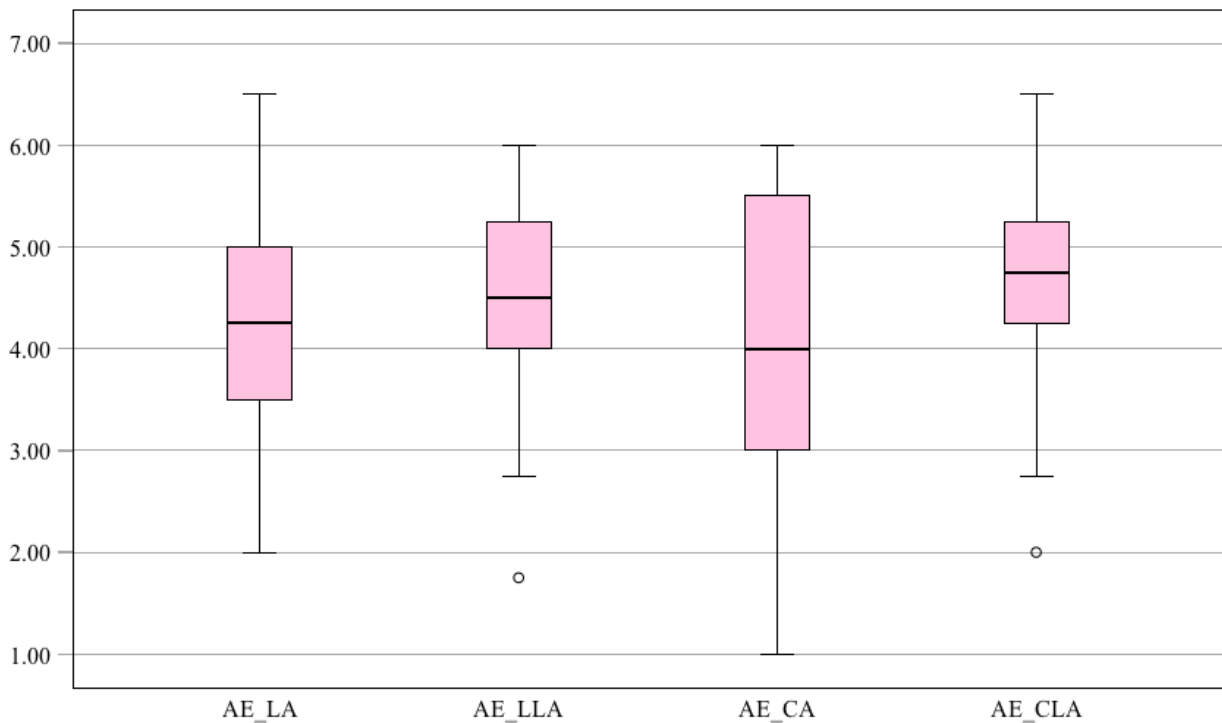
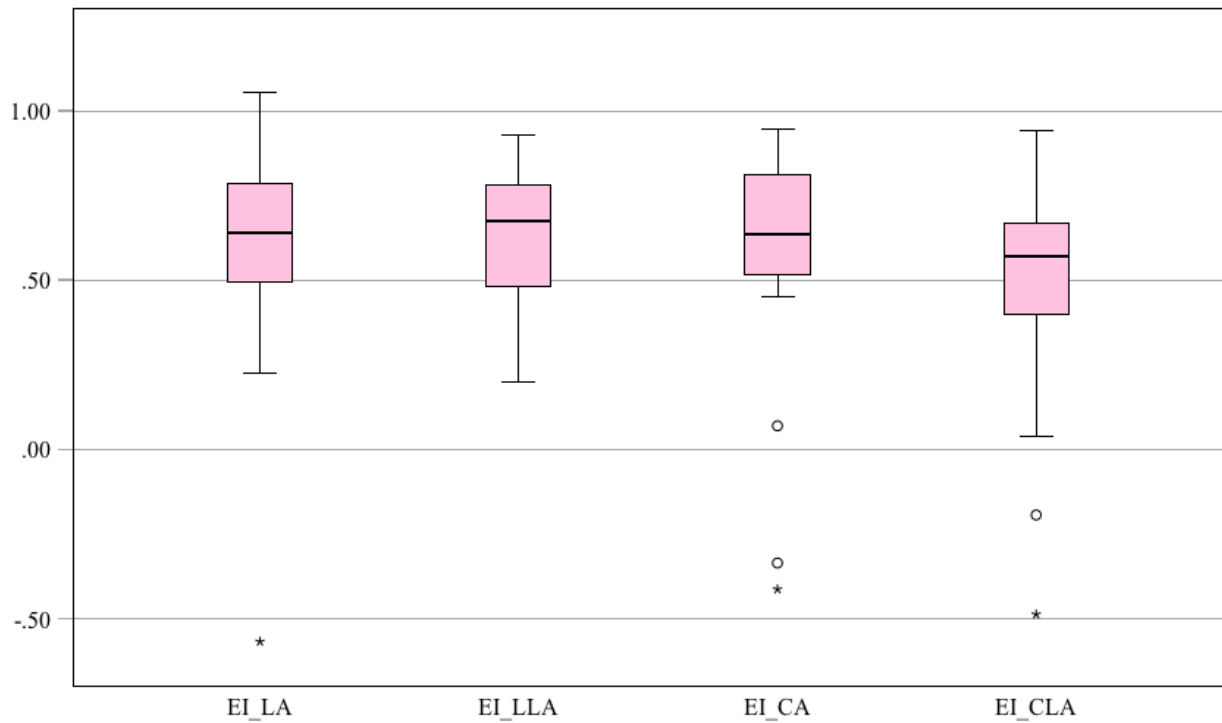


Figure 3

Changes in Emotional Intensity (EI) Based on Groupings of Narrative Complexity and Film Style

**Table 3**

Wilcoxon Signed-Rank Test and Friedman's Test Comparing Affective Empathy and Emotional Intensity Scores Based on Groupings of Narrative Complexity and Film Style

Comparison Groups	Affective Empathy	Emotional Intensity
	Sig. <i>p</i>	Sig. <i>p</i>
L vs. C	.788	.040*
LA vs. LLA	.180	.569
CA vs. CLA	.131	.362
LA vs. LLA vs. CA vs. CLA	.299	.118

Note. L = Linear, C = Complex, LA = Linear Animation, LLA = Linear Live-Action, CA = Complex Animation, CLA = Complex Live-Action

* $p < .05$.

Discussion

The aim of the present study was to investigate whether narrative complexity had an effect on either affective empathy or emotional intensity, as well as if film style played any additional role in these relationships. Participants took part in a repeated measures experimental design where they watched six short films and subsequently answered a number of questions regarding their experience and thoughts of each film. In our sample, the degree of narrative complexity displayed no effect in participants' levels of affective empathy. In contrast, a significant effect was found for narrative complexity and emotional intensity. Furthermore, the film being animated or live-action displayed no significant effect.

Narrative Complexity

In the present study, narrative complexity did not significantly affect participants' affective empathy towards the characters of each film. There are a few possible explanations for these results. Firstly, as Cameron et al. (2019) suggests, empathy is a motivated process and entails cognitive effort. In view of this, people may avoid empathy situations in order to avoid the effort as well as potential emotional costs they involve. With respect to art experiences, many literary theorists have suggested that this effect may occur within readers (Gerrig & Mumper, 2019). Since literature and film are largely narrative forms, this effect is also possibly found in film viewers. With our chosen films being mostly from the horror/thriller genres, it may be that participants avoided the potential distress of connecting with the characters, thus interfering with their empathic engagement. As suffering motivates people to avoid empathy (Gerrig & Mumper, 2019), it follows that the distressing aspects of the short films interfered with our participants' empathy levels. Secondly, similarity has been shown to be a powerful predictor of empathy in both regular social settings (McKeever, 2014) as well as in regards to fictional characters (Gerrig & Mumper, 2019). Similarity can be based on a number of different factors, including shared experiences, physical appearance as well as mannerisms. In our chosen films, the main characters were of varying ages, from being children to full-grown adults, as well as varying genders. This diversity of characters may have affected participants' reactions. Since we did not measure how strongly participants identified with each of the characters, this is a factor that could have influenced their empathy levels without our knowledge.

Moreover, narrative complexity may elicit very different reactions from different individuals. Keen (2007) proposed that narrative difficulty may either promote empathy, by way of capturing individuals' attention, or impede empathy, by way of alienating individuals. Bearing this in mind, it is difficult to discern how complex narratives may affect different people, as the

confusion that is usually elicited from these narratives may captivate one individual while also disengaging another. A variety of different factors could play a role in this, for instance the person's past experience with complex narratives, their disposition in regards to cognitive challenges and their available cognitive resources when watching the film. Due to the limited variables we measured, it is unknown to what extent other factors could have influenced participants' experiences of the complex narratives.

With respect to emotional intensity and narrative complexity, the results demonstrate that individuals' emotions were more intense after watching the linear films than after the complex films. This is contrary to findings by Bar-Anan et al. (2009) that found that uncertainty in filmic conditions led to intensified affective reactions of both positive and negative emotions. In our case, the uncertainty and confusion elicited by the complex films appear to have had the opposite effect. One possible explanation for these different findings lies in the reasons why people watch films. Plantinga (2009) points out that for many individuals, film is linked to leisure and entertainment. By contrast, the more confusing nature of the short films in our study may have been outside of what participants are used to and enjoy when engaging with films. The cognitive challenges that the complex films posed may have disengaged viewers due to falling outside of participants' usual film-watching expectations and habits. Since the chosen linear films follow more conventional storylines, this may have facilitated participants' emotional processing. Additionally, according to the Cognitive Appraisal Theory of Emotion, the emotions elicited by a stimulus may be largely determined by the specific situation that is portrayed (Zupan & Babbage, 2017). Thus, presenting situations that correspond to viewers' experiences may enhance their emotional responses. With the complex films depicting rather out of the ordinary situations, it is possible that participants felt a lack of personal relevance to these films as opposed to the linear

ones. This in turn may have led to lower levels of emotional engagement with the complex films, as participants were disconnected from what they were viewing.

Film Style

The use of animated or live-action visuals demonstrated no significant difference with regards to my dependent variables. This lies in contrast to the proposal that animated films may be particularly effective at facilitating empathy and emotions due to their exaggerated expressions (Jenkins, 2013) and ability to convey hidden inner states (Piepiórka, 2021). Animation has often been used as a tool to illustrate characters' thoughts, desires and feelings, beyond what is typically achieved in live-action films (Piepiórka, 2021). As such, animation may closely attach viewers to the characters, increasing their empathy as they are directly drawn into characters' emotional worlds. Despite this, there are a number of potential reasons why such an effect was not found in our sample. Firstly, these results were based on the presentation of only two animated and four live-action short films. This, coupled with our relatively small sample ($N = 34$), provides rather limited data for making a definitive conclusion on the empathic capabilities of animation. Secondly, the chosen films were controlled based only on genre, language, number of main characters and duration, thus there are a variety of other filmic qualities that could have influenced the results. For instance, the particular content of each film as well as the particular characters may have personally connected with participants in different ways, altering their experience of each film outside of the factors we considered.

It is also possible that the emotional benefits of animation are only applicable to distinct demographics. Animation has been used as an expressive tool for those with autism spectrum disorder (ASD), especially children, allowing them to communicate their emotions where they usually struggle to do so (Holmgaard et al., 2013). A study by Kellems et al. (2023) found that

children with ASD had an easier time engaging with and identifying the emotions of animated avatars over real humans. Bearing this in mind, our insignificant results may be due to the characteristics of our sample rather than an indication that animation yields no effects on affective empathy nor emotional intensity across all groups.

Implications and Future Research Directions

Concerning narrative complexity, further research is required to establish its potential. While our results may have been insignificant, there are a number of theories that suggest that it is related to viewers' empathy and emotions (Anderson et al., 2019; Bar-Anan et al., 2009; Huang & Grizzard, 2022). To verify this, future studies could benefit from using short films that are more precisely classified as complex, such as by having more specific restrictions for the film categorizations. More emphasis could also be placed on matching the short films on a wider variety of variables, ensuring that participants' responses are not being affected by external factors. It may also be of interest to use films that more closely relate to the sample of choice, by selecting films that appear to be similar to the chosen demographic as well as by measuring the extent to which participants feel similar to the characters in the films. In doing so, researchers could better isolate the effects of narrative complexity and control for the confounds that existed in our study. Additionally, future studies may benefit from using films outside of the thriller/horror genre, as the fear induced by these genres may have impeded empathy in our study. A more diverse array of genres could evoke a more diverse array of emotional reactions, providing more opportunities for participants to feel with the characters. Finally, to further extend our research, differences between complex literature vs. films could also be analyzed, contrasting the effects of these distinct narrative forms. Specific art mediums possibly elicit different responses from consumers, thus it could be useful to compare them.

Moreover, despite its insignificant results, our study offers potential theoretical implications for how animation can be further studied. For instance, distinctions between animation styles should be considered as the category of animation includes a broad range of techniques that may yield different effects. It is also of interest to investigate the use of animation in different genres, as it may be more useful for inducing empathy in different emotional settings. Our choice of horror/thriller short films may have elicited an empathy avoidance response due to the potential emotional costs of engaging with these narratives. Thus, it is of relevance to consider how different genres in tandem with animated styles work together to affect individuals' experiences of the films. A broadness of samples should also be used to study animation, as it is possible that animated styles may elicit stronger emotions in different groups. For example, as mentioned above, animation has been found to be beneficial for the emotional expression of children with ASD (Holmgaard et al., 2013; Kellems et al., 2023). Future research could focus on this demographic, such as by investigating the different effects animation yields on those with and without ASD.

In general, research in this field could focus on additional factors that influence the empathy levels of participants when engaging with films. More specifically, narrative complexity could be studied with a wider variety of films, as a way to control for possible confounding variables. Additionally, more focus could be placed on the influence of characteristics of participants, for instance by examining participants' past experiences with complex narratives. With regards to studying empathy and emotional reactions, research would benefit from using an increased number of questions to study these constructs. Future research could also more thoroughly investigate emotional engagement, for instance by analyzing the valence of emotions in addition to their intensity. Overall, it would be beneficial to study these variables on a larger

scale, with consideration to the number of films and items used for each variable, as well as the number of participants involved in the research.

Study Limitations

The present study had a number of limitations. For instance, participants were recruited via convenience sampling, with a majority being psychology Bachelor students at the RUG. As a result, our findings may not be generalizable to other populations (Bornstein et al., 2013). Likewise, our study was only conducted in English, which may also impact the generalizability of our results to different languages. The experiment itself also had a variety of research errors, including differences in sound volume and room lighting, as well as background noise, which may have all contributed to participants' immersion and focus on each short film. Additionally, the research design had multiple potential confounds, especially in regards to the selection of short films. While we did match the short films on a number of criteria (e.g. genre), the films also have many differences, including subject matter, content, character, etc. These unmeasured differences may have contributed to participants' experiences. For the animated films in particular, their animation styles are quite different, thus it is questionable how justified it is to place them in the same category. Lastly, both affective empathy and emotional intensity were measured with a limited number of questions, meaning important aspects of their conceptualisations may be missing from participants' responses. In regards to strengths, our use of an experimental design is beneficial to replicate because it can establish causality. As such, the present study acts as a preliminary design for future research to build upon.

Conclusion

In conclusion, the relevance of narrative complexity as well as film style to both empathic and emotional engagement remain inconclusive. While the present study did not yield significant results, there is much that remains to be studied in the current field. This study acts as a preliminary exploration of the influences of narrative complexity and film style, opening new avenues for future research to study these factors in more depth. Further research can refine our experimental design in order to control for a wider variety of factors, allowing for more precise and definitive results. Considering the limitations, our study can be used as a starting point for further investigations in this field.

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Appendix A

Background/Demographic Questionnaire

Film Background

1. Which film genres do you prefer to watch? You can pick and rank up to 5 genres that you prefer most: Action, adventure, animation, arthouse, comedy, documentary, drama, experimental, fantasy, horror, musical, romance, science fiction, thriller, Western
2. In the past three months, how often have you watched a film?: More than 4 times a week, 2-3 times a week, once a week, 1-2 times a month, less than once a month, I did not watch a film in the past three months

Demographic Information

1. What is your age?
2. What study are you enrolled in?
3. What is your gender?: Male, female, non-binary/third gender, prefer not to say
4. On a scale from 0 to 100, how feminine or masculine would you describe yourself?
By masculinity and femininity we refer to the relatively enduring characteristics encompassing traits, appearances, interests, and behaviors that have traditionally been considered relatively more typical of women and men, respectively.

Personality (Ten-Item Personality Inventory; Gosling et al., 2003)

I see myself as . . . (rated from disagree strongly to agree strongly)

1. Extraverted, enthusiastic
2. Critical, quarrelsome
3. Dependable, self disciplined
4. Open to new experiences, complex

5. Reserved, quiet
6. Sympathetic, warm
7. Disorganized, careless
8. Calm, emotionally stable
9. Conventional, uncreative

Post-Film Questionnaire

Artistic Experience

1. What is your first impression of the film (1 minute free-writing procedure)

Immersion (Narrative Engagement scale; Busselle & Bilandzic, 2009)

Rate the following items on a scale of 1 to 7 (strongly disagree to strongly agree):

1. While viewing I was completely immersed in the world created by the film
2. While viewing I found myself thinking about other things

Cognitive stimulation (Scale of Aesthetic Appreciation of Film; Doicaru, 2016)

Rate the following items on a scale of 1 to 7 (strongly disagree to strongly agree):

1. It is stimulating to make sense of this film
2. While watching this film, I felt curious at times

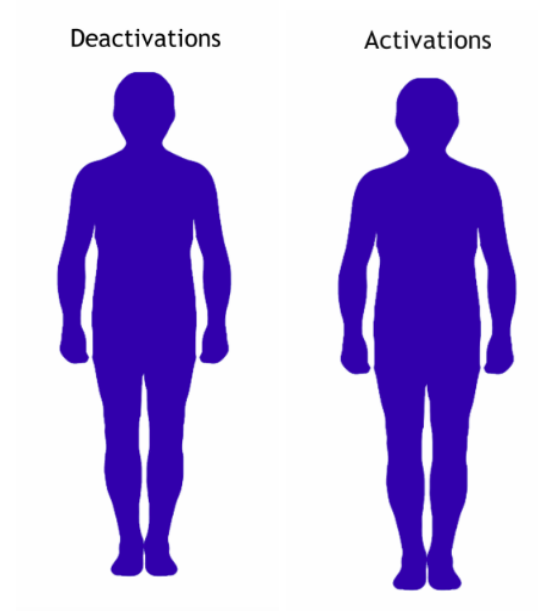
Narrative complexity

1. How complex would you rate the narrative of this short film?: not complex at all to very complex on a 0 to 100 scale

Bodily sensations (Bodily Sensation Maps; Schino et al., 2021, 2022)

You will be displayed with two body silhouettes. On the left body silhouette, please, indicate where in the body you feel stronger, that is with more energy (e.g.: muscles tensing, flushed face, pounding heart, etc.) when experiencing the artwork in front of you. On the right

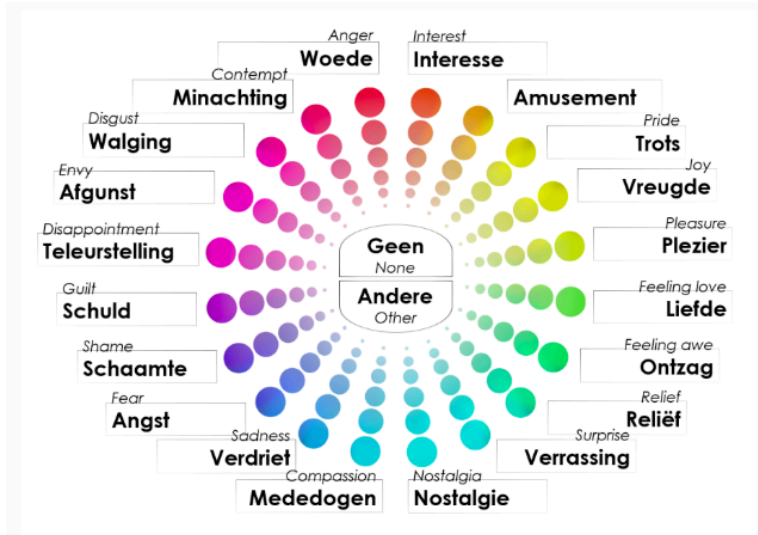
body silhouette indicates where in the body you feel weaker, that is with less energy (e.g.: woozy body parts, lightheadedness, numbness in the extremities, etc.) when experiencing the artwork in front of you. For both silhouettes, you can click up to 10 times. Try to be as accurate as possible. If necessary, use more clicks to stress a particular zone where the feeling is more intense. You can point to any region of the body you feel appropriate, from the head to the toes. If you made a mistake, drag the dot to move it somewhere else; or just press on the dot you want to remove.



Emotional resonance (Geneva Emotion Wheel; Tinio & Gartsus, 2018)

1. Which emotion(s) did you feel while viewing the film clip?

Choose up to two emotions in the wheel that you feel (indicated by a particular spoke) and its intensity (the further away from the center the more intense the emotion).



2. In case you selected “Other”, how would you name the emotion you felt?

Affective and Cognitive Empathy (Empathy State Scale; Shen, 2010)

Rate the following items on a scale of 1 to 7 (disagree strongly to agree strongly):

1. I experienced the same emotions as the character when watching this film
2. I can feel the character’s emotions
3. I can see the character’s point of view
4. The character’s reactions to the situation are understandable

Short Film Experience

1. Have you seen this short film before?: not sure, no, partly, yes

Table A1*Measured Variables and Materials*

Variable	Between-subject or Within-subject Factor	Material	Description
Movement Energy (ME)	Within-subject	Movement Energy Analysis (Ramseyer, 2020)	A frame-differentiating method is applied to the raw data to generate a time series for each short film.
Immersion	Within-subject	Narrative Engagement Scale (Busselle & Bilandzic, 2009)	2 items from the Attentional Focus subscale rated on a 7 point Likert scale from strongly disagree to strongly agree
Cognitive Stimulation	Within-subject	Scale of Aesthetic Appreciation of Film (Doicaru, 2016)	2 items from the Cognitive Stimulation scale rated on a 7 point Likert scale from strongly disagree to strongly agree
Emotional Resonance	Within-subject	Geneva Emotion Wheel (Tinio & Gartus, 2018)	Participants select from 20 emotion types and rate the emotion with regards to five intensity levels.
Bodily Sensations	Within-subject	Bodily Sensation Map (Schino et al., 2021, 2022)	Participants visually identify body areas that are activated during emotional arousal.
Affective and Cognitive	Within-subject	Empathy State Scale (Shen, 2010)	2 items from the Affective Empathy

Variable	Between-subject or Within-subject Factor	Material	Description
Empathy			subscale and 2 items from the Cognitive Empathy subscale rated on a 7 point Likert scale from strongly disagree to strongly agree
Artistic Experience	Within-subject	Thematic Analysis	Participants think aloud about their film watching experience and their words are organized into the clusters of appreciation or enjoyment.
Personality	Between-subject	Ten-Item Personality Inventory (Gosling et al., 2003)	2 Items from the Extraversion Scale on a 7 point Likert Scale from strongly disagree to strongly agree

Appendix B

Figure B1

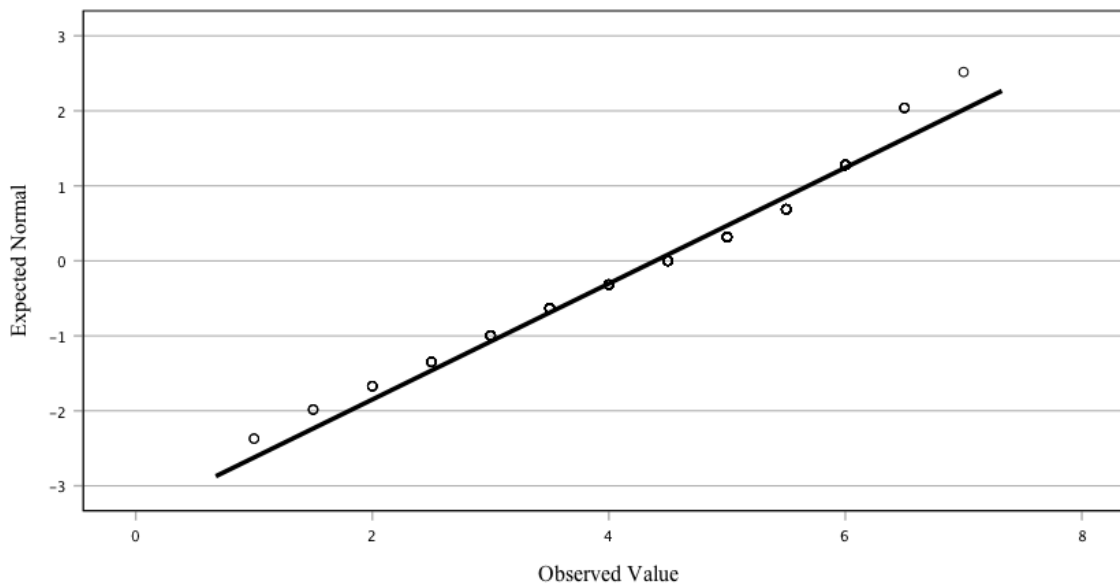
Normal Q-Q plot of Affective Empathy

Figure B2

Normal Q-Q plot of Emotional Intensity