Parasocial Relationships with Live Streamers: Effects of Attachment Insecurity and Perceived Streamer Responsiveness

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Abstract

In modern times, human social life happens offline as well as online. A special type of relationship that has seen an increase is the so-called *parasocial relationship* (PSRs) with live streamers. Live streaming has greatly increased since the COVID-19 pandemic, offering more opportunities for relationships with these streamers. However, it remains unclear whether and how those specific PSRs serve the same function and offer similar benefits as offline relationships. The current study investigates whether and how attachment insecurity and perceived streamer responsiveness interactively affect a viewer's commitment, needs fulfillment, and life satisfaction. To this end, 94 participants filled in an online questionnaire. Our findings revealed that there was an interaction effect between attachment insecurity and perceived streamer responsiveness on commitment and life satisfaction, but not on needs fulfillment. People reported stronger commitment and life satisfaction when they perceived stronger streamer responsiveness, but only if they were higher in attachment insecurity. For securely attached individuals, these effects were weaker or even negative. This implies that typical psychological factors are at work in PSRs with live streamers, but that responsive PSRs may be more beneficial for individuals with stronger insecure attachment. As such, PSRs may be beneficial and should not be stigmatized.

Keywords: attachment insecurity, live streaming, parasocial relationships, responsiveness

Introduction

Before the rise of the internet and social media, social relationships were mostly formed and maintained face-to-face. Nowadays, social interaction also happens online, in chat rooms, but also via *live streaming*, such as people streaming video games in real-time. Live streaming has become increasingly popular, with statistics suggesting that ~25% of internet users watch live streams weekly (Kumar, 2024; Rehmani, 2024). During those, viewers can engage and connect with the streamer by texting in chat rooms, donating money, and more. However, it remains unclear whether people can form a psychological connection with a streamer, and whether this can function similarly to an offline social relationship that fulfills people's needs and contributes to their life satisfaction. A survey of live stream viewers suggests that ~50% of them perceive live stream interaction as similarly real and valuable as those happening offline (GlobalWebIndex, 2020), but scientific research is lacking.

We conceptualize parasocial relationships (PSRs) as one-sided relationships with media figures (Achterberg & Achterberg, 2020). PSRs are often seen as unhealthy and linked to social deficits (Morin, 2025), but research has indicated that they can have benefits, like reducing prejudice and loneliness (Hoffner & Bond, 2022; Kowert & Daniel Jr., 2021). A meta-analysis by Tukachinsky et al. (2020) showed that PSRs share similarities with offline relationships, and research suggested that they elicit the same emotions as in offline contexts (Kowert & Daniel Jr., 2021), implying that both relationships potentially share commonalities. PSRs with live streamers present a special case of PSRs, as they are not completely one-sided (i.e., through social interactions, viewers and streamers can respond to each other) (Kowert & Daniel Jr., 2021). This thesis aims to investigate them more closely.

Specifically, Segal and Fraley (2015) identified three key factors involved in offline (romantic) relationships that we assume may also be relevant for PSRs with live streamers: insecure attachment, perceived partner responsiveness, and commitment. If this type of PSR

functions like offline relationships, then we should find strong parallels. Indeed, our focus on potential PSRs with live streamers justifies the variables in our research question, due to the increased opportunity for responsiveness in live streams, and how this responsiveness, combined with a viewer's attachment insecurity, might affect their overall needs fulfillment and life satisfaction via commitment. The present research will thus investigate how fulfilling parasocial relationships with live streamers can be and which psychological factors underlie their effect, as this has not been researched in the context of PSRs yet.

Insecure Attachment and the Need for Parasocial Relationships

According to the attachment theory (Bowlby, 1969) attachment styles form during one's early life, based on how responsive a child's main caretaker is to their expressed needs. Attachment insecurity (Bowlby, 1969; see also Ainsworth, 1978) spans both avoidant and anxious attachment styles. People with an avoidant attachment style report being uncomfortable with close relationships, while those with anxious attachment crave them (Hazan & Shaver, 1987). Both types of attachment insecurity are linked to lesser needs fulfillment (e.g., belongingness; Deci & Ryan, 2000; Gagné, 2003) and other negative consequences, such as "more frequent symptoms of pain and ill-health" (Feeny, 2000). While attachment is originally formed with a main caretaker, it becomes relevant for any relationship a person can form, including friendships and romantic relationships. In these cases, attachment insecurity has been found to play a negative role in relationship functioning and satisfaction (Mikulincer & Shaver, 2011).

According to Bowlby (1969), the actual and perceived responsiveness of the caregiver is vital in the development of *insecure* (or secure) attachment styles and, hence, how people engage in relationships. Insecurely attached individuals are more suspicious of relationships (due, for example, to the lack of responsiveness of their caregiver while growing up), and PSRs may be an attractive substitute. This applies well to live streamers, given that this PSR

includes social interactions and hence the possibility for perceiving responsiveness (of the streamer). Insecurely attached individuals may thus have a stronger *need* to form PSRs, because they offer an accessible and reliable way to meet their unmet needs of forming close social bonds (Cole & Leets, 1999)

Freeman and Brown (2001) have demonstrated that while securely attached adolescents prefer their parents over friends, the opposite was true for insecure attachment. *Insecure attachment* has been linked to the experience and intensity of PSRs (Madison et al., 2015; Tukachinsky et al., 2020), presumably because attachment anxiety motivates using PSRs to compensate for real-life relationships. This raises the question of whether more insecurely attached people prefer other relationships, such as PSRs, over closer face-to-face relations. As noted above, insecure attachment is caused by lower responsiveness by a caregiver and linked to lesser needs fulfillment (Deci & Ryan, 2000; Gagné, 2003). However, virtually connecting with a live streamer and forming a PSR might provide these people with an alternative for needs fulfillment. A meta-analysis conducted by Tukachinsky et al. (2020) indeed found evidence positively linking PSR intensity with anxious attachment. We thus expect that insecurely attached individuals might have a higher need for PSRs, such as with live streamers, to increase their needs fulfillment and alleviate other negative consequences associated with insecure attachment. The preference for PSRs with streamers over other fictional characters or celebrities should be related to the higher responsiveness of the streamer, as this is what insecurely attached individuals lacked during their early childhood years.

The Role of Perceived Responsiveness In Parasocial Relationships with Live Streamers

Perceiving responsiveness in a relationship may be key when interacting with a live streamer. As opposed to one-sided PSRs with media figures, PSRs with live streamers add an important element that offline relationships already have - the opportunity for perceiving

responsiveness (Kowert & Daniel Jr., 2021). In a study of people in long-term romantic relationships, Segal and Fraley (2015) found that a partner's responsiveness was positively related to satisfaction with the relationship and that insecurely attached individuals were less likely to perceive their partner as responsive to their needs and felt lower commitment to the relationship (Segal & Fraley, 2015). Reis and Gable (2015) found that responsiveness was associated with higher personal well-being, but that it is not necessarily the *observed* amount of understanding or validation, but rather the amount of *perceived* partner responsiveness. This perceived responsiveness promotes well-being and relationship satisfaction by fostering trust and intimacy, and its effect is not limited to romantic relationships, as it has also been found in roommates, patients and their physicians, in the work setting, and even among strangers (Reis & Gable, 2015). *Perceived partner responsiveness* has been found to foster commitment, as well as needs fulfilment. (Segal & Fraley, 2015).

These findings indicate that the role of perceived responsiveness might also apply to PSRs with live streamers, where higher perceived responsiveness of the streamer will facilitate the (parasocial) relationship-building process, possibly leading to stronger relationships. These relations with the streamer might then positively affect viewers' well-being and needs fulfillment.

The streaming context opens up the possibility of reciprocal communication. This reciprocity is why Kowert and Daniel Jr. (2021) refer to this instance of PSR as one-and-a-half-sided and can form the basis for the PSR with live streamers. Communication in real-time streaming is made possible by chat rooms, which enable the viewer to talk to the streamer and the streamer to acknowledge the viewer by replying to their messages. The streamer's responsiveness to their viewers might affect the degree to which viewers can form a (parasocial) relationship with the streamer, as the reciprocal communication blurs the line between what is "real" and what is "virtual". This enables viewers to form a more genuine,

authentic relationship with the streamer, as they have the option to actively engage with the person (unlike in the case of, for example, television).

Assuming PSRs function like offline relationships, we would expect the responsiveness of the streamer to play a crucial role in the formation, strength, and benefits of PSRs for the viewers. This should be particularly the case for more insecurely attached viewers, for whom responsive PSRs may be an attractive option.

The Relevance of Psychological Commitment for Needs Fulfillment and Life Satisfaction

Research shows that commitment plays an important role in offline relationships (Le and Agnew, 2003; Rusbult, 1980; Segal & Fraley, 2015; Tran et al., 2019) and if PSRs function similarly, it can therefore aid our understanding of how perceived responsiveness leads to needs fulfilment. According to Rusbult et al. (1980), couples reporting lower commitment were less likely to have stayed together. Le and Agnew (2003) also found it to be a significant predictor of breakup, highlighting its importance for relationship functioning. People's commitment[1] to relationships has been shown to increase needs fulfillment for all three of the basic human needs: autonomy, relatedness, and belonging. Those basic needs, as outlined by self-determination theory, play a role in practically all aspects of a human's life and functioning (Ryan & Deci, 2017) and should contribute to life satisfaction more generally. As romantic relationships have been shown to fulfill these needs, it remains to be seen how a more responsive PSR can affect those needs and one's overall life satisfaction.

The current research hence aims to explore the role of commitment in the context of PSRs with live streamers. Increased commitment might strengthen the relationship between attachment insecurity and perceived responsiveness, leading to a stronger influence on needs fulfillment.

[1] Psychological commitment is predicted by the investment resources into the relationship (Rusbult, 1980). Viewers can invest their time, but also monetary resources.

The Current Research

This study investigates whether PSRs have the potential to fulfill basic human needs and increase life satisfaction, in a similar way that face-to-face relationships do. If viewers form relationships with live streamers as they do with people offline, then those relationships should be able to fulfill the viewer's basic human needs and affect their life satisfaction. While attachment insecurity has been negatively linked to needs fulfillment (Deci & Ryan, 2000; Gagné, 2003), we expect that parasocial relationships may present an alternative option for insecurely attached individuals to achieve needs fulfillment, that is, when they perceive the streamer as more responsive. Figure 1 depicts the expected relations between these variables.

We thus expect that attachment insecurity will interact with the streamer's responsiveness, as perceived responsiveness has been linked to increased well-being (Reis & Gable, 2015).

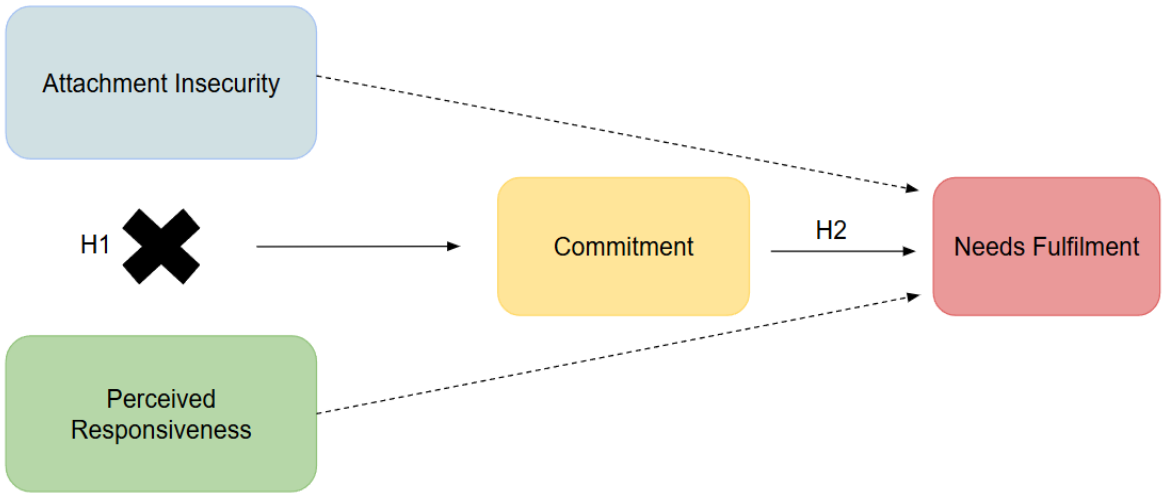
H1: Higher attachment insecurity and higher perceived streamer responsiveness interact to jointly increase viewers' needs fulfillment.

We further expect that the interactive effect of attachment insecurity and perceived streamer responsiveness is mediated by the level of commitment a viewer has towards the streamer. This follows findings that linked higher commitment to relationship satisfaction (Rusbult, 1980; Le & Agnew, 2003; Tran et al., 2019). Higher relationship satisfaction due to a higher level of commitment is therefore expected to lead to stronger needs fulfillment and a stronger effect on general well-being.

H2: The interaction effect between attachment insecurity and responsiveness is mediated by a viewer's level of commitment, where higher commitment leads to higher needs fulfillment.

Figure 1

Proposed Model



Method

Participants

Given the focus on streamers, participants were recruited via streaming-related social media. The participants were not compensated for their participation. The requirements for participation were a minimum age of 18 and watching livestreams on a (semi-)regular basis. At the beginning of data collection, the survey link was solely shared on the platform Discord, on three different servers of live streamers. However, as we only managed to collect 43 responses via this method, we decided to expand the data collection onto other social media platforms, namely Reddit, Instagram, and WhatsApp. This resulted in 160 participants.

In total, around half of our participants were recruited via social media, while the remaining 45.7% were sampled from the three Discord servers. The streamers mainly stream video games (Andruwu 7.4%; Kyedae 9.6%; Todo 28.7%). We asked the participants recruited via other social media which streamer they were thinking of and found that the majority of streamers also focused on gaming-related content, meaning that our subsamples thought of comparable streamers. Over two-thirds of the participants were between the ages

of 18 and 24, followed by 24.5% of respondents being between 25-34, and 6.4% of participants were 35 or older. Out of the 94 people we surveyed, 46,8% identified as male, 43.6% as female, and 9.6% as non-binary or a third gender. Germans made up 12.8% of the sample, while both Americans and Dutch participants accounted for nearly 10% each. Other nationalities, such as Australian, Singaporean, and Malaysian, were also found in the sample.

Although the raw data included 160 participants, 66 respondents were excluded post-hoc, as 46 participants did not begin the survey, with 22 of them stopping before the consent form. Ten respondents did not consent to their data being processed, one of whom also did not consent to their participation. Finally, 10 more respondents were removed due to not watching livestreams regularly. The final data set consisted of 94 participants. This was below the calculated number for sufficient statistical power to detect a medium-sized interaction effect (f = 0.25) with a power of 80%, which suggested a minimum requirement of 179 participants (a target, we rounded up to 200 to account for possible dropouts). As we only managed to collect analysable data from 94 participants, the power of the statistical analysis is expected to be lower, and findings should be interpreted with caution (i.e., we might not be able to detect small effects).

Design and Procedure

This study utilized a correlational design with two predictors, attachment insecurity and perceived streamer responsiveness. The outcome was viewers' needs fulfillment and, in a more exploratory sense, general life satisfaction. Our design also included a possible mediator, namely, commitment to the streamer. We also explored whether viewers experienced a parasocial relationship with the streamer, as we assumed.

Participants were asked to fill out a questionnaire, which was expected to take 10 minutes. The study was approved by the ethical committee of the Faculty of Behavioural and Social Sciences at the University of Groningen (ECP code: PSY-2425-S-0164). At the start of

the survey, participants were given information about the research and asked to consent to the participation and the processing of their data. This was followed by demographic questions and a question about whether they watch livestreams on a (semi-)regular basis. If they answered negatively, they could not proceed to the survey. The questionnaire included established measures for our key variables (specified below). At the end of the questionnaire, participants were debriefed.

All analyses were conducted in SPSS, Version 30 (IBM Corp., 2024). Before investigating the hypotheses, we first conducted factor analyses and reliability analyses for the scales we planned to use and made scaling decisions accordingly. We then calculated the means and standard deviations for all our variables, as well as their correlations (see Table 1 below). To test our hypotheses (see Tables 2-6 below), we ran multiple linear regression analyses with attachment insecurity and streamer responsiveness as predictors, needs fulfillment (and, by extension, life satisfaction) as the outcome, and commitment as the potential mediator. Model 1 of the PROCESS macro extension was used for simple slope analyses, and we planned to use Model 7 to run the mediation analysis, if applicable (Hayes, 2013).

Measures

Predictor 1: Attachment Insecurity

To assess the participants' attachment style and determine their level of attachment insecurity, we used the full Experience in Close Relationships Scale – Short Form (ECR-S), developed by Wei et al. (2007). The items were assessed on a 7-point Likert scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*), where a higher score reflects more insecure attachment. An example of an item assessing attachment insecurity was "I do not often worry about being abandoned". The full scale, as it was used in our questionnaire, can be found in Appendix A.

We note that the original scale differentiated between attachment anxiety and attachment avoidance (Wei et al., 2007), reflecting two types of insecure attachment. In our questionnaire, we merged both subscales into one, including all 12 items with 6 items representing each subscale (α = .74). This was done because we were interested in how attachment insecurity in general played a role in the proposed model. While our factor analysis revealed that some items loaded on the intended subscale, multiple items did not follow this trend. We found that one item for attachment avoidance loaded on the anxiety subscale, while three attachment items loaded on three factors and did not properly distinguish between the two subscales. As these items represented important concepts and removing them would lead to decrease in reliability, we decided to combine both subscales into one.

Predictor 2: Perceived Streamer Responsiveness

We used 10 items (α = .95) to measure how responsive the viewer perceived the streamer to be. We asked them how often the viewer perceived that the streamer acknowledged them, responded to messages they sent in the chat, and mentioned them by name, in addition to using seven items of the Perceived Partner Responsiveness Scale (PPRS) by Reis et al. (2017). All items were scored on a 7-point Likert scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*), such as "[The streamer] …expresses liking and encouragement for me". A higher score on these measures reflected a higher level of responsiveness from the live streamer, as perceived by the viewer. We decided not to use the full scale as we did not want our participants to lose focus while answering multiple long scales. We excluded items from our scale if we found them to be too similar to others, avoiding asking participants the same questions multiple times. Based on the factor analysis we conducted, we can conclude that all the items we selected from the PPSR loaded on one factor, as did the items we created ourselves. Our three items also loaded on a second factor,

but as they all loaded on the same factor as those from the PPSR with similar strength, we created one general responsiveness scale. We also used one item to assess the overall perceived relationship quality with the streamer, which acted as a validation item for a positive relationship perception. The complete and adapted scale can be found in Appendix A.

Potential Mediator: Commitment to the Streamer

To measure participants' level of commitment to the streamer and their relationship to them, we used seven items from the scales[2] created in the context of the Investment model introduced by Rusbult et al. (1998). The phrasing of the items was adapted to the streaming context. Participants had to rate these items on a 7-point Likert scale ranging from 1 (*Strongly Disagree*) to (*Strongly Agree*). Items were chosen based on how applicable they were to relationships outside of romantic ones. We further used three items specifically for the live streaming context, asking participants how much time, money, and effort they had spent on the streamer, answered on a scale from 1 (*None*) to 7 (*A lot*). As validation, we asked the viewers how much they thought spending their resources was worth it, on a scale from 1 (*Not At All*) to 7 (*Completely*), which was not included in the scale. As all items except for two loaded on one factor, we decided to merge the items we chose into one commitment scale. The items loading on a different factor related to wanting to continue to follow and support the streamer, a central concept, and were thus not removed. The scale had a reliability of α = .88. One example item was "I want to continue to actively support the streamer". Higher scores indicated a stronger commitment. The merged scale can be found in Appendix A.

Outcome: Needs Fulfilment

We then measured perceived needs fulfilment in terms of autonomy, relatedness and competence. To do this, we used nine items from the Basic Psychological Needs Satisfaction Scale (BPNSS) (Deci & Ryan , 2000; Gagné , 2003), three for each need, for example, "I feel

[2] We used the scales for general commitment level and investment size.

like I am free to decide for myself how to live my life". The scale had an acceptable internal consistency (α = .75). We decided against using the complete scale as to avoid response fatigue. Furthermore, our factor analysis failed to reveal a clear distinction between the three suggested needs, which is why we grouped them into one scale. All the items were scored on a 7-point Likert scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*) and can be found in Appendix A. A higher score on the needs fulfillment scale reflected a greater satisfaction with one's needs being met.

Exploratory Outcome: Life Satisfaction

In addition to needs fulfillment, we also measured general life satisfaction. Our measures for needs fulfillment focused on the three basic human needs, but we wanted to include a more general measure of perceived quality of life. For this measure, we used the full five-item Satisfaction with Life Scale (SWLS) by Diener et al. (1985) to assess participants' general life satisfaction. Our reliability check showed an internal reliability of α = .89. An example item was "In most ways, my life is close to my ideal" and the items were scored on a 7-point Likert scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). A higher score represents higher satisfaction with one's life. The scale can be found in Appendix A.

Exploratory Variable: Parasocial Relationship Experience

As one of our underlying assumptions was that viewers form a PSR relationship with the streamer, we used 15 items to measure how strongly viewers perceive a parasocial relationship with the live streamer (α = .88). For this, we used three items of the Experience of Parasocial Interaction Scale (EPSI Scale) by Hartmann and Goldhoorn (2011), which were adapted to the streaming context and read "[While watching the stream, the streamer…] is aware of me; knows I am there; reacts to what I say or do". We further assessed viewers' experiences with the parasocial relation with 12 items of the Parasocial Interaction Scale as used by Rubin et al. (1985). The scale was originally used regarding newscasters and had 20

items, but was adapted to the streaming context, with items such as “The streamer makes me feel comfortable, as if I was with a friend”. All items were scored on a 7-point Likert scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). After conducting a factor analysis, where most items loaded on both factors, indicating that we could not successfully differentiate between the scales used, we decided to merge them. A high score on this scale indicated a stronger experience of a PSR with the streamer. The completely adapted scale can be seen in Appendix A.

Results

Table 1 depicts the means and standard deviations of all scales, along with their correlations. On average, viewers indeed experienced a PSR with the streamer (M = 4.56, SD= 1.06). We also checked the viewers’ perceived relationship quality to validate whether a positive relation could be investigated. This validation item was rated on a scale from 1 (*Very Bad*) to 7 (*Very Good*), and suggested a generally positive relationship (M = 4.93, SD = 1.12).

Table 1

Correlations Between the Predictors and their Descriptives

	Mean	Std. Dev.		1	2	3	4	5
1. Attachment Insecurity	3.42	0.89						
2. Streamer Responsiveness	3.68	1.57	*r*	.18				
			p	.104				
			N	87				
3. Commitment	3.45	1.20	*r*	.32**	.71**			
			p	.003	<.001			
			N	86	86			
4. Needs Fulfillment	4.81	0.92	*r*	-.47**	-.01	-.22*		
			p	<.001	.950	.040		
			N	85	85	85		
5. Life Satisfaction	4.09	1.49	*r*	-.37**	-.12	-.09	.48''	
			p	<.001	.270	.393	<.001	
			N	85	85	85	85	
6. Parasocial Relationship	4.56	1.06	*r*	.30**	.74**	.82**	-.24*	-.19
			p	.005	.001	<.001	.025	.087
			N	89	87	86	85	85

Note. ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed). Parasocial relationship and Life Satisfaction were exploratory variables

Hypothesis Testing

We wanted to test whether and how attachment insecurity and higher perceived responsiveness are related to a viewer's needs fulfillment, but did not find an interaction.

As depicted in Table 1, attachment insecurity did not correlate with perceived responsiveness (r = .18, p = .104). In line with expectations, attachment insecurity correlated negatively with needs fulfillment (r = -.47, p < .001). Unexpectedly, however, perceived streamer responsiveness did not correlate with needs fulfillment (r = -.01, p = .950).

To test the first hypothesis, we ran a multiple linear regression with attachment insecurity, streamer responsiveness, and their two-way interaction as predictors of needs fulfillment. Before that, we checked that the assumptions of linearity, independence of errors, homoscedasticity, normality of the residuals, and no multicollinearity were met[3]. Overall, the model was significant (F = 8.10, p < .001, R^2 = .23), but, crucially, the interaction term was not significant (p = .786; see Table 2). When we therefore ran the same model without the interaction term, we found that only attachment insecurity predicted needs fulfillment and did so negatively (see Table 2). Thus, those with stronger insecurity reported weaker need fulfillment.

[3] Scatterplots showed that the assumptions of linearity and homoscedasticity were met. The Durbin-Watson test (1.69) showed no violation of independence of errors. Histograms and Q-Q plots showed no violation of normality of residuals. The assumption of no multicollinearity was investigated using tolerance values (.97) and VIF (1.04) and no violation was detected.

Table 2

Results of the Regression Analysis for Testing Hypothesis H1

Variable	*B*	*SE*	*t*	*p*	95% *CI*
Model with Interaction					
Constant	6.09	0.91	6.67	<.001**	4.27, 7.90
Attachment Insecurity	-0.43	0.27	-1.59	.115	-0.96, 0.11
Streamer Responsiveness	0.11	0.22	0.48	.630	-0.34, 0.55
Attachment Insecurity X Streamer Responsiveness	-0.02	0.06	-0.27	.786	-0.14, 0.11
Model without Interaction					
Constant	6.31	0.38	16.80	<.001**	5.57, 7.06
Attachment Insecurity	-0.49	0.10	-4.95	<.001**	-0.69, -0.30
Streamer Responsiveness	-0.05	0.06	0.86	.394	-0.07, 0.17

Note. Dependent variable: Needs Fulfillment

Exploring Life Satisfaction

Even though the regression analysis on needs fulfillment did not find evidence in support of H1, we ran the same analysis on our exploratory outcome variable, life satisfaction. Attachment insecurity was negatively related to life satisfaction (r = -.37, p < .001), but streamer responsiveness did not correlate with life satisfaction (r = -.12, p = 270). For this multiple linear regression, all five assumptions were once again tested, and all were met[4]. The model with the interaction term was significant (F = 5.80, p = .001, R^2 = .18), and the interaction term was significant as well (p = .049; see Table 3). Together, the two variables increased the viewer's life satisfaction.

[4] Scatterplots were used to confirm the assumption of linearity and homoscedasticity, while Q-Q plots and histograms satisfied the assumption of normality of the residuals. Tolerance values (.97) and VIF (1.04) assured that there was no multicollinearity. Lastly, a Durbin-Watson test validated the assumption of independence of errors (DW = 1.66).

Table 3

Results of the Exploratory Analysis on Life Satisfaction

Variable	*B*	*SE*	*t*	*p*	95% *CI*
Model with Interaction					
Constant	9.04	1.53	5.91	<.001**	6.00, 12.08
Attachment Insecurity	-1.41	0.45	-3.15	.002**	-2.30, -0.52
Streamer Responsiveness	-0.77	0.37	-2.07	.042*	-1.51, -0.02
Attachment Insecurity X Streamer Responsiveness	0.21	0.11	2.00	.049*	0.01, 0.42

Note. Dependent Variable: Life Satisfaction

To investigate the interaction pattern, we conducted a simple slope analysis using the PROCESS macro extension, Model 1 (Hayes, 2013). The assumptions from the previous analysis hold. The coefficients for the simple analysis can be found in Table 4, and Figure 2 displays the interaction effect pattern. For those higher in attachment insecurity (+1SD from the mean), we found a non-significant increase in life satisfaction via more responsiveness from the streamer (b = 0.14, p = .310), in line with our expectations that more responsiveness from the streamer would be beneficial for insecurely attached individuals. However, for those lower in attachment insecurity (-1SD from the mean) (b = -0.24, p = .077), more perceived responsiveness slightly decreased their life satisfaction. Even so, neither effect was statistically significant. A closer look at the Johnson-Neyman output (see Appendix B) revealed that the moderating effect of attachment insecurity on the relation between perceived streamer responsiveness was only statistically significant for very low values (-1.55 below the mean) of attachment insecurity. This means that only for those individuals with a very secure attachment style did the effect of attachment insecurity on perceived streamer responsiveness significantly differ from 0 and was therefore only significant for these low values of insecurity. When looking at values +-2SD of the mean, we found that the more extreme the

values on attachment insecurity were, the more significant the difference with 0 became. For the more extreme values for attachment insecurity 2SD below the mean, so more secure attachment, the difference became statistically significant. This means that at very low or high levels of attachment insecurity, the effect of perceived responsiveness of attachment insecurity seems to be the most relevant, as opposed to more average values. For those with a very secure attachment, the effect was strong enough to be detected as significant, indicating that the effect is stronger for those with secure attachment styles.

Table 4

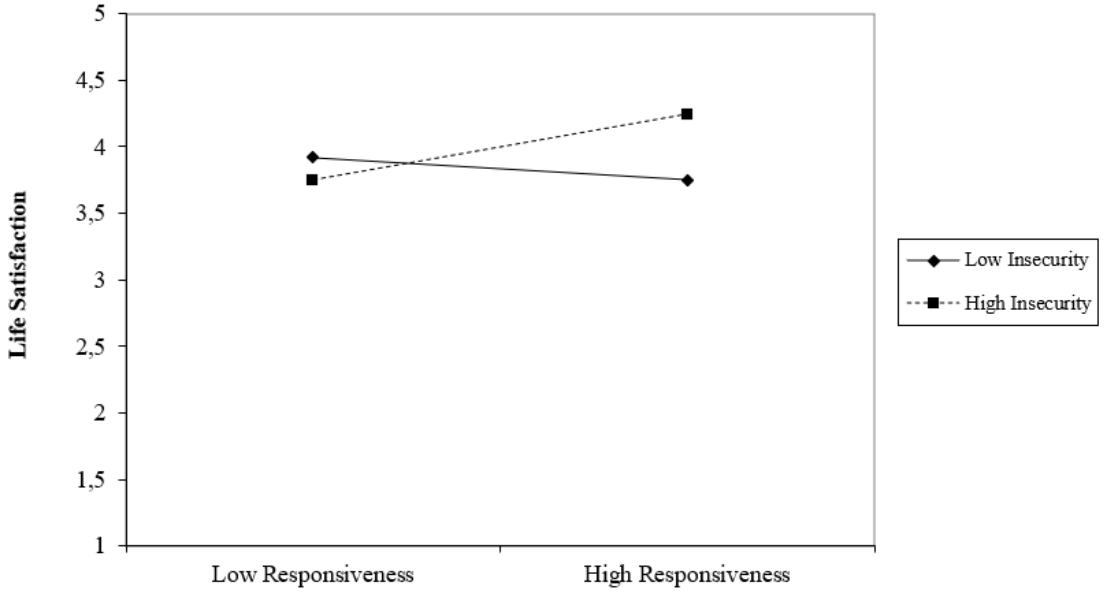
Conditional Effects of the Focal Predictor at Values of the Moderator

Attachment Insecurity	*B*	*SE*	*t*	*p*	*95% CI*
-0.91 (-1SD)	-0.24	0.14	-1.79	.077	-0.52, 0.03
0.00 (M)	-0.05	0.10	-0.55	.582	-0.25, 0.14
0.91 (+1SD)	0.14	0.14	1.02	.310	-0.13, 0.41

Note. Dependent Variable: Life Satisfaction

Figure 2[5]

Interaction between Attachment Insecurity and Streamer Responsiveness on Life Satisfaction



Both figures of the interaction effects were generated using a Microsoft Excel Extension by Dawson, J. F. (2025)

Multiple Linear Regression with Attachment Insecurity and Responsiveness on Commitment

To confirm whether we could include commitment as a mediator[6] in our hypothesized model (with life satisfaction rather than needs fulfilment), we first ran a multiple linear regression analysis to check whether the interaction of our two predictors affected commitment levels in the same way as on life satisfaction. Before running the regression, we tested the necessary assumptions and found no significant violations[7]. The model was significant ($F = 37.51$, $p < .001$) and explained 58% of the variance of commitment and the interaction term was significant at $p = .004$ (see Table 5). The combination of the two predictors led to an increase in the commitment towards the streamer.

Table 5

Results of the Exploratory Analysis on Commitment

Variable	*B*	*SE*	*t*	*p*	95% CI
Model with Interaction					
Constant	2.99	0.89	3.37	.001**	1.22, 4.75
Attachment Insecurity	-0.44	0.26	-1.71	.091	-0.95, 0.07
Streamer Responsiveness	-0.11	0.22	-0.53	.601	-0.55, 0.32
Attachment Insecurity X Streamer Responsiveness	0.18	0.06	2.99	.004**	0.06, 0.30

Note. Dependent Variable: Commitment

[6] The experience of a PSR with the streamer did not result in a significant interaction term ($p = .827$) and was therefore not explored as a mediator. Both predictors individually were significant (attachment insecurity: $p = .008$; streamer responsiveness: $p < .001$).

[7] A scatterplot showed that the assumption of linearity and homoscedasticity were not violated. A Q-Q plot and histogram supported the normality of residuals assumption. The multicollinearity assumption was not violated, as indicated by our tolerance values(.97) and VIF (1.03). The independence of errors was checked with a Durbin-Watson test (1.82).

To investigate this interaction effect, we ran another simple slope analysis, using PROCESS Model 1 (Hayes, 2013). The coefficients can be found in Table 6, while Figure 3 depicts the interaction pattern. Results suggested that for those higher in insecure attachment (+1SD from the mean) ($b = 0.68$, $p < .001$), the effect of perceived responsiveness increasing commitment was stronger than for those with attachment insecurity ($b = 0.34$, $p < .001$), although both effects were statistically significant. This is in line with the idea that those more insecurely attached commit more strongly to responsive PSRs, such as those with live streamers.

Table 6

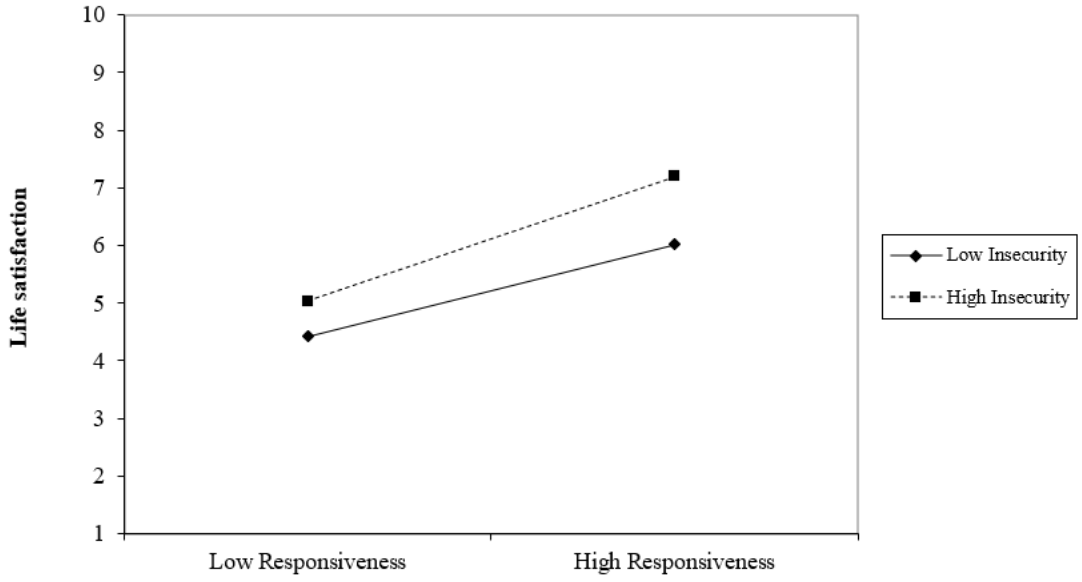
Conditional Effects of the Focal Predictor at Values of the Moderator

Attachment Insecurity	*B*	*SE*	*t*	*p*	*95% CI*
-0.91 (-1SD)	0.34	0.08	4.34	< .001	0.19, 0.50
0.00 (M)	0.51	0.06	9.11	< .001	0.40, 0.62
0.91 (+1SD)	0.68	0.08	8.61	< .001	0.52, 0.83

Note. Dependent Variable: Commitment

Figure 3

Interaction Between Attachment Insecurity and Streamer Responsiveness on Commitment



Moderated Mediation Analysis on Life Satisfaction

Comparing the two patterns of interaction, we observed that they are not similar. Attachment insecurity plays a significant role in combination with perceived streamer responsiveness. For those with insecure attachment, more responsiveness related to an increase in life satisfaction, whereas this effect was opposite for more secure attachment. However, neither of these effects was statistically significant. On the other hand, their interaction on commitment was different. For those with higher attachment insecurity scores, higher responsiveness led to significantly more commitment, while the effect for those with lower insecurity was still positive, but weaker. As the patterns on commitment and life satisfaction were not similar, a moderated mediation analysis was not tested, also due to the lack of correlation between commitment and life satisfaction (r = -.09, p = .393)

Discussion

This research aimed to investigate whether PSRs with live streamers may be psychologically similar to offline relationships and whether PSRs have similar benefits for viewers. We found that PSR with live streamers seemed to function somewhat similarly as would be expected from offline relationships (as evident from our findings for attachment insecurity, perceived responsiveness, and commitment playing a role in these PSRs). However, the effects of PSRs with live streamers on outcomes such as needs fulfillment and life satisfaction seemed to exhibit potential differences, with those higher (but not lower) in attachment insecurity seemingly benefitting from the PSR. Generally, our findings suggest that for individuals with higher attachment insecurity, PSRs with live streamers may present a viable alternative relationship. Our findings for those with more secure attachment styles were inconsistent, with potential benefits for commitment but a negative effect on life satisfaction. We discuss the answer to our research question and its implications below, together with

limitations of the study and directions for future research to take based on the current findings.

Do PSRs with Live Streamers Function like Offline Relationships?

In line with previous research, we found that attachment insecurity alone was a negative predictor of both needs fulfillment and life satisfaction, decreasing both of them (Deci & Ryan, 2000; Gagné, 2003). However, we did not find evidence for an interaction effect of attachment insecurity and perceived streamer responsiveness on needs fulfillment.

When looking at overall life satisfaction, the interaction term became significant, where higher attachment insecurity and higher perceived responsiveness from the streamer increased the viewer's reported life satisfaction. Surprisingly, we found that for viewers who were more securely attached, more perceived responsiveness slightly decreased their life satisfaction. This suggests PSRs with live streamers might have different effects depending on the viewer's attachment style. This is not surprising, as previous research has already linked more insecure attachment to the experience and strength of PSR (Tukachinsky et al., 2020). While we did not find direct evidence for H1, that higher levels of our predictors interact to increase needs fulfillment, we did find the expected effect on life satisfaction.

Furthermore, previous relationship research revealed that higher perceived responsiveness from the relationship partner increased one's commitment to the relationship, and attachment insecurity was negatively related to commitment (Segal & Fraley, 2015; Rusbult, 1980). In line with those findings, our data suggests that the more insecurely attached a viewer was, the lower the commitment to the streamer was. Expanding on the previous findings, we found an interaction of attachment style and perceived streamer responsiveness on a viewer's level of commitment to the streamer. Generally, commitment increased as the viewer perceived more responsiveness from the streamer, regardless of their attachment insecurity. However, this effect was stronger for those higher in attachment insecurity. This

might relate to previous findings suggesting that those with more insecure attachment styles often perceive their relationship partner as less responsive (Segal & Fraley, 2015). Therefore, to increase the commitment of a more insecurely attached viewer, a streamer needs to show more responsiveness, as it might not be perceived as such at lower levels, as opposed to those sufficient for people with secure attachment.

We were unable to establish commitment as a mediator. In the model with needs fulfillment, we did not find an interaction on the outcome, so there was no relation to be mediated. Regarding life satisfaction, we found interaction effects on both commitment and life satisfaction, but commitment did not correlate with life satisfaction, ruling out a mediation. As we were unable to test a mediation, we did not find evidence for the findings from Bucher et al. (2018), that more committed individuals also reported higher needs fulfillment. Hence, we could not test or support H2.

Overall, we found relations among all the components found in previous literature. Similarly to research on romantic relationships, we found a difference between secure and insecure attachment styles. The effect of PSRs with streamers was positive only for those with more insecure attachment, in line with the expectation that more insecurely attached individuals might use the PSR as a substitute for the relations they are lacking offline.

Implications

Our findings support the notion that PSRs, in our case with live streamers, are not necessarily harmful, as previously suggested by evidence that PSRs can reduce loneliness and prejudice (Hoffner & Bond, 2022; Kowert & Daniel Jr., 2021). While we did not include those specific measures, the increase of commitment and, more importantly, life satisfaction for those with insecure attachment support the notion of PSRs having potential benefits. Similarly to offline social relationships, we found that the experience of a responsive PSR was linked to positive outcomes in those with insecure attachment. Specifically, responsiveness

was linked to life satisfaction. This supports findings from previous research (Reis & Gable, 2015; Segal & Fraley, 2015). Society should therefore attempt to reduce the negative perception of PSR and educate people on their potential positive effects, to prevent social exclusion of those who might benefit from them.

However, it is also important to investigate the potential negative effects of responsive PSR for those with more secure attachment, as we found that their life satisfaction decreased as the streamer was perceived as more responsive. This may be linked to them perceiving the relationship as more of an obligation, rather than a form of entertainment. This notion is corroborated by our findings that more generally, individuals with more secure attachment overall experienced lower levels of commitment to the relationship, and, while more streamer responsiveness increased their commitment, it did so less strongly. This is likely due to them not needing to see these interactions as relationships and care for them, as opposed to those with more insecure attachment, who might require them to act as a substitute. Similarly, our findings support what Cole and Leets (1999) suggested, namely that those with more insecure attachment may be more in need of alternative relationships due to their needs not being met in their formative years. This increased need could explain why we found a (non-significant) increase in life satisfaction for those with higher attachment insecurity, as well as why the significant effect on commitment was stronger for those with a more insecure attachment.

The data in this study also indicates that this more responsive kind of PSRs functions similarly to offline social relationships, where the same underlying factors appear to be at work. This is in line with Tukachinsky et al. (2020), suggesting that PSRs and offline relationships function similarly. The role of responsiveness that has been repeatedly highlighted (e.g., by Segal and Fraley, 2015) was also found to be crucial in our research. This responsiveness element might be what sets PSRs with live streamers apart from other PSRs with celebrities or other media figures. These findings may extend to other “1.5-sided”

relationships, such as those formed with AI companions, such as chatbots. Previous research has shown that such chatbots can be a companion to humans (Chaturvedi et al., 2023) and that roughly a quarter of young people feel it is possible to form social bonds with bots (Levitsky, 2025). These bots can be perceived as highly responsive due to their uninterrupted availability. Research by Fan et al. (2017) has shown that participants do not differentiate between attributed emotional intelligence for robots and humans. It could therefore be expected that if one perceived an AI chatbot to be emotionally intelligent and responsive, a PSR with them can be formed and function similarly to what we found in the current research. The findings on commitment could also be investigated in the context of online subscription websites, such as OnlyFans, where these factors could explain an individual's readiness to spend money on a creator.

More generally, our findings also present a first step towards investigating a more responsive version of PSR and how similar they are to previously researched relationships. They also highlight that while relationships can have similar working components and effects, the way that they function might differ and should be taken into consideration when comparing different types of relationships. Different relationships do not all follow the same pattern and it is important to distinguish between them and their respective interactions of components.

The more responsive a streamer is, and depending on how openly they present themselves, the easier it should be to form a PSR with them. Here, the visual aspect of face-to-face interactions is highlighted, as seeing a person and their facial expression and other non-verbal behaviours can increase the responsiveness one perceives (Itzchakov et al., 2021). Streamers aiming to generate connections with their viewers should therefore focus on being responsive and enabling viewers to see their nonverbal behaviours as well, to increase the viewers' support and their overall popularity. Similarly, a streamer focusing their content on

lifestyle themes might seem more relatable, making them more easily to connect to from the viewers' point of view, due to perceived homophily, a working component in other types of social relationships (Tukachinsky et al., 2020). Not being distracted by, for example, the video games one chooses to stream also offers a higher amount of responsiveness from the streamer. This indicates that there are steps that can be taken by the streamer to enable genuine connections with viewers.

Limitations and Future Research

As mentioned earlier, our sample size was lower than hoped. Due to this, we might have been unable to detect smaller effects, and the findings should be interpreted with caution. This was due to our inability to find a large enough sample in the first place, but also because of the large attrition rate in our collected sample. Most participants dropped out after opening the questionnaire, which might indicate a lack of motivation. Nevertheless, our data suggested sizable correlations between attachment insecurity, perceived streamer responsiveness, commitment, and life satisfaction; future research should thus aim to replicate this study with a larger sample to increase the power and confirm these effects. A higher sample size could further uncover smaller effects that we might have been unable to detect. Attrition due to a lack of motivation could be avoided by offering external, streaming-related rewards, such as gifted subscriptions to the streamer. More generally, a higher number of responses could be reached by working with streamers and having them endorse and distribute the survey to their viewers. Lastly, some of our measures and instructions for needs fulfillment might have been unclear, and participants may have been unable to make the connection between their relationship with the streamer and their needs being met. In future studies, the instructions could be more specific, instructing participants to think about how the streamer has helped with these needs.

Additionally, given that our research was conducted as a correlational design, we cannot make any definitive causal claims and further research is needed to confirm the findings from this study. In following studies, researchers could attempt to experimentally manipulate, for example, how much responsiveness is perceived from the streamer, by having separate conditions with varying levels of reaction and interactions with a live streamer. This would enable a test of the internal validity of a major part of the current findings.

We also made methodological choices to focus on streamers in more general terms, which might lead to over-generalization. It would be worthwhile to explore how these PSRs develop with different kinds of streamers and whether the benefits or their strengths might differ based on these distinctions. These distinctions could be the popularity of the streamer, as the opportunity for interaction decreases with the number of viewers, or having a pre-existing relationship with them, such as supporting a streaming friend. Due to the importance of perceived streamer responsiveness, the benefits of PSRs might therefore be more successful for relatively small-scale streamers. Further distinctions can be made between the type of content a streamer focuses on (e.g., video games, lifestyle) and how they visually present themselves during their streams. Some streamers use no camera at all, while others have created virtual models of themselves or a fake persona, so-called V-Tubers, while the last group includes streamers using a webcam. The different visual displays might affect the ease and strength with which viewers can form a kind of relationship to them, due to the varying degrees of perceived personality. Overall, further studies should look into comparing different types of streamers based on their popularity, visual choices, and overlap with offline social relationships.

We also made the choice to focus on general measures of satisfaction of life and needs, but we could not investigate possible negative effects of perceiving PSRs with live streamers, such as their loneliness, negative emotions such as jealousy compared to other

viewers, how obsessive viewers might become over the perceived relationship and whether some social deficits can be found, as suggested by Morin (2025). More studies should be run that include potential negative outcomes, as this could shed light on why these types of relationships might not be as satisfying for people with more secure attachment. These studies can aim to see if and which negative effects exist for individuals with insecure attachment that accompany the potential benefits we found. This could be done by investigating concepts such as perceived obligation, negative emotions, and obsessive tendencies towards the streamer. In that way, researchers could determine when, and through what factors, PSRs with live streamers can be harmful or beneficial.

Conclusion

Overall, our data suggests that similar psychological factors that have previously been highlighted to play a role in offline social relationships seem to apply to PSRs with live streamers. However, how exactly these factors interact in this more responsive kind of PSR and whether this interaction mirrors those of other social relationships remains to be seen in future research. Our study specifically highlights the role of both higher attachment insecurity and the perceived responsiveness from a streamer affecting what outcomes a viewer perceives. Specifically for individuals with more insecure attachment styles, forming a PSR with a streamer can offer a suitable alternative to unsatisfying offline relationships, where the PSR may benefit their life satisfaction. Hopefully, future research will continue to investigate this kind of special parasocial relationship to determine in more detail for whom and how these kinds of relationships present a healthy and viable substitute for and how this can be used to increase the life satisfaction of these individuals.

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Appendix A

Questionnaire Items

Attachment Insecurity – Adapted ECR-S (Wei et al., 2007)

It helps to turn to my (romantic) partner in times of need. (R)

I need a lot of reassurance that I am loved by my partner.

I want to get close to my partner, but I keep pulling back.

I find that my partner(s) don't want to get as close as I would like.

I turn to my partner for many things, including comfort and reassurance. (R)

My desire to be very close sometimes scares people away.

I try to avoid getting too close to my partner.

I do not often worry about being abandoned. (R)

I usually discuss my problems and concerns with my partner. (R)

I get frustrated if romantic partners are not available when I need them.

I am nervous when partners get too close to me.

I worry that (romantic) partners won't care about me as much as I care about them.

Perceived Streamer Responsiveness

Adapted PPRS (Reis et al., 2017)

The streamer usually…

…really listens to me.

…is really responsive to my needs.

…understands me.

…expresses liking and encouragement for me.

…seems interested in what I am thinking and feeling.

…values my abilities and opinions.

…respects me.

Own Items

One a scale from 1 (never) to 7 (every time), how often does the streamer…

…acknowledges you specifically. (Example: greeting you when they see you joining/watching)

…mention you by name.

…responds to something you write in the chat.

Commitment Adapted Commitment Level and Investment Size Scales (based on Rusbult et al., 1998)

Commitment Level

I am committed to continuing to follow the streamer.

I feel very strongly linked to the streamer.

I want to continue to actively support the streamer.

Investment Size

I have put a great deal into supporting the streamer that I would lose.

Compared to other viewers I know, I have invested a great deal.

I feel very involved in supporting the streamer – like I have put a great deal into it.

Many aspects of my life have become linked to the streamer.

Own Items

To what extent do you think you are spending time/effort/money on the streamer?

Needs Fulfillment – Shortened BPNSS (Deci & Ryan , 2000; Gagné , 2003)

I feel like I am free to decide for myself how to live my life.

I really like the people I interact with.

Often, I do not feel very competent. (R)

I have been able to learn interesting new skills recently.

In my daily life, I frequently have to do what I am told. (R)

People in my life care about me.

There are not many people that I am close to. (R)

I often do not feel very capable. (R)

There is not much opportunity for me to decide for myself how to do things in my daily life. (R)

Life Satisfaction – SWLS (Diener et al., 1985)

In most ways, my life is close to ideal.

The conditions of my life are excellent.

I am satisfied with my life.

So far, I have gotten the important things I want in life.

If I could live my life over, I would change almost nothing.

Parasocial Relationships – Adapted EPSI Scale and Parasocial Interaction Scale (Hartmann and Goldhoorn, 2011; Rubin et al., 1985)

EPSI Scale

While watching the stream, the streamer…

…is aware of me.

…knows I am there.

…reacts to what I say or do.

Parasocial Interaction Scale

The stream shows me what the streamer is like.

I like to compare my ideas with what the streamer says in their stream.

The streamer makes me feel comfortable, as if I was with a friend.

I see the streamer as a natural, down-to-earth person.

I like hearing the voice of the streamer in my home.

The streamer keeps me company while the stream is running.

I look forward to watching more of the streamer's streams.

If the streamer would appear in another person's stream, I would watch it.

I would miss the streamer if they went on vacation.

I would like to meet the streamer in person.

I find the streamer to be attractive.

I feel sorry for the streamer when they make a mistake.

Appendix B

Simple Slope Analysis on Life Satisfaction

Conditional effect of focal predictor at values of the moderator:

AttachIn	Effect	se	t	p	LLCI	ULCI
-1,9206	-,4557	,2244	-2,0302	,0456	-,9022	-,0091
-1,7248	-,4146	,2061	-2,0122	,0475	-,8246	-,0046
-1,5534	-,3787	,1903	-1,9897	,0500	-,7574	,0000
-1,5289	-,3736	,1881	-1,9858	,0504	-,7479	,0007
-1,3331	-,3326	,1708	-1,9471	,0550	-,6724	,0073
-1,1373	-,2915	,1543	-1,8899	,0624	-,5984	,0154
-,9414	-,2505	,1388	-1,8047	,0748	-,5266	,0257
-,7456	-,2095	,1248	-1,6781	,0972	-,4578	,0389
-,5498	-,1684	,1129	-1,4922	,1395	-,3930	,0562
-,3539	-,1274	,1037	-1,2290	,2226	-,3336	,0789
-,1581	-,0864	,0980	-,8816	,3806	-,2813	,1086
,0377	-,0453	,0964	-,4702	,6395	-,2371	,1465
,2336	-,0043	,0992	-,0433	,9656	-,2016	,1930
,4294	,0367	,1059	,3468	,7297	-,1740	,2475
,6252	,0778	,1160	,6704	,5045	-,1530	,3086
,8211	,1188	,1286	,9239	,3583	-,1370	,3746
1,0169	,1598	,1430	1,1175	,2671	-,1248	,4444
1,2127	,2009	,1588	1,2647	,2096	-,1152	,5169
1,4086	,2419	,1756	1,3774	,1722	-,1075	,5913
1,6044	,2829	,1931	1,4649	,1468	-,1014	,6672
1,8002	,3240	,2112	1,5339	,1290	-,0963	,7442
1,9961	,3650	,2297	1,5891	,1159	-,0920	,8220

Simple Slope Analysis on Commitment

Conditional effect of focal predictor at values of the moderator:

AttachIn	Effect	se	t	p	LLCI	ULCI
-1,9331	,1591	,1310	1,2149	,2279	-,1015	,4197
-1,7373	,1948	,1203	1,6190	,1093	-,0446	,4342

-1,5827	,2230	,1121	1,9893	,0500	,0000	,4459
-1,5415	,2305	,1099	2,0970	,0391	,0118	,4491
-1,3456	,2661	,0998	2,6659	,0092	,0675	,4647
-1,1498	,3018	,0902	3,3455	,0012	,1223	,4812
-,9540	,3375	,0812	4,1557	,0001	,1759	,4990
-,7581	,3731	,0730	5,1082	,0000	,2278	,5184
-,5623	,4088	,0660	6,1898	,0000	,2774	,5402
-,3665	,4444	,0606	7,3339	,0000	,3239	,5650
-,1706	,4801	,0572	8,3977	,0000	,3664	,5938
,0252	,5158	,0561	9,1905	,0000	,4041	,6274
,2210	,5514	,0576	9,5772	,0000	,4369	,6660
,4169	,5871	,0614	9,5670	,0000	,4650	,7092
,6127	,6227	,0671	9,2821	,0000	,4893	,7562
,8085	,6584	,0743	8,8606	,0000	,5106	,8062
1,0044	,6941	,0826	8,4002	,0000	,5297	,8584
1,2002	,7297	,0917	7,9539	,0000	,5472	,9122
1,3960	,7654	,1015	7,5445	,0000	,5636	,9672
1,5919	,8011	,1116	7,1786	,0000	,5791	1,0230
1,7877	,8367	,1221	6,8554	,0000	,5939	1,0795
1,9835	,8724	,1328	6,5708	,0000	,6083	1,1365