

Utrecht University – Clinical- and Health Psychology



Touched by music: Attachment-Related Differences in Music-Induced Crying and Lyrics

Master Thesis

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Summary/Samenvatting

Adult attachment controls the approach a person uses when confronted with emotional events. Individual differences in handling these situations can be understood by understanding the underlying mechanisms of attachment. The focus of this research is to investigate attachment-related differences in music-induced crying by exploring the connection of language, more specifically song lyrics, attachment and crying. It was hypothesized that the croon songs of anxiously (fearfully and preoccupiedly) attached individuals will contain more negative and less positive emotion words in their lyrics than those of securely attached individuals. The croon songs of dismissively attached individuals were expected to contain less positive and negative attachment-specific words than croon songs of anxiously attached individuals and the secure and dismissive group were expected to appreciate the beauty of the lyrics more often than the other two groups. The sample consisted of 3032 Dutch radio listeners (38% male, 62% female), who completed a number of questionnaires about attachment, crying behavior and the last song that made them cry. The mean age was 36.92 years ($SD=12.13$). Thirty-six top croon-songs emerged, divided by the four attachment styles (secure, fearful, preoccupied and dismissive). The song lyrics were analyzed by the Linguistic Inquiry and Word Count (LIWC) computer program on positive and negative emotion- and attachment-related words. The probability of correlational significance was small due to small N (36), so besides performing an ANOVA, also effect sizes (Cohen's d) were computed to express the strength of the relationships between the variables. It was found that the croon songs of the two anxiously attached groups contained more positive and less negative emotion words. The results have also shown that croon songs of fearfully attached individuals contained less negative attachment-specific words than those of the dismissive group and that croon songs of dismissives also contained slightly more positive and negative attachment-specific words than those of preoccupiedly attached individuals. There was no evidence that the secure and preoccupied groups appreciated croon song lyrics more often than the other two groups.

Our findings were not corresponding with the stated hypotheses the way we expected, but in the discussion part of this study there is a number of encouraging theoretical explanations for these results.

Preface/Voorwoord

Op deze plaats in mijn thesis wil ik graag mijn dank uiten aan dr. Henriët van Middendorp, docente aan de Universiteit Utrecht en drs. Anja Laan, beleidsmedewerkster wetenschappelijk onderzoek bij de Reinier van Arkel Groep in Den Bosch. Tijdens het voorbereiden en uitvoeren van het onderzoek hadden zij altijd een luisterend oor voor problemen waar ik tegenaan liep en stonden zij klaar met goede raad als ik het nodig had. Tevens wisten zij mij gemotiveerd te houden om het vele werk wat deze thesis inhield goed te dragen en om deze tot een goed einde te brengen.

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1. Introduction/Introductie

Aan het begin van het afgelopen studiejaar zocht ik naar een onderzoeksonderwerp voor de master thesis. Al snel heb ik een aantal onderwerpen gevonden die mij erg trokken. Tijdens mijn studie heb ik psychologie van verschillende hoeken en kanten gezien en dat heeft mij geholpen om uiteindelijk een keuze te maken voor een thema dat mij interesseert – gehechtheid. Omdat mijn bachelorscriptie onder andere over hechting ging, heb ik besloten om mij in dit onderwerp verder te verdiepen tijdens mijn masterstudie.

In dit onderzoek leg ik verbanden tussen de verschillende hechtingsstijlen en emotiegedrag dat daaruit voortvloeit – huilen. Om dit brede vraagstuk nader af te bakenen heb ik gekozen om een specifieke huilsituatie te beoordelen, namelijk huilen naar aanleiding van muziek. Tot nu toe zijn er weinig studies gedaan naar huilen in samenhang met hechting en muziek en daarom denk ik dat mijn onderzoek een grondbeginsel kan vormen voor een meer uitgebreid onderzoek en een bijdrage is aan de huidige veldverkenning. Ook het gebruik van een geautomatiseerde methode van tekstverwerking, het programma Linguistic Inquiry and Word Count (LIWC), is innovatief op het gebied van hechting.

Hoewel dit onderzoeksverslag bedoeld is voor het vakkundig psychologisch publiek en mijn collega-studenten, heb ik geprobeerd om zo goed mogelijk duidelijk en helder te schrijven en om onduidelijk vakjargon waar nodig uit te leggen, zodat ook een leek kan begrijpen wat de kern van het onderzoek is.

De opbouw van deze scriptie is systematisch en kopieert de empirische cyclus. In de theoretische inleiding formuleer ik op basis van verschillende bestaande theorieën de onderzoeksvragen en geef ik aan wat de samenhang is van dit onderzoek met andere publicaties en onderzoeksverslagen op dit gebied. In het methodegedeelte beschrijf en verantwoord ik de opzet en uitvoering van het onderzoek, waaronder de steekproef en de gekozen meetinstrumenten. Hierna volgt de resultatensectie waar de gevonden resultaten worden beschreven en de hypothesen geïnventariseerd. In de discussie/conclusie interpreteer ik de resultaten in het licht van het huidige theoretische kader en daarna volgt een evaluerend hoofdstuk over sterke en zwakke punten van mijn onderzoek samen met implicaties voor de praktijk en suggesties voor verder onderzoek.

2. Theoretical overview and hypotheses

Attachment is an affectional bond that one person or animal forms between him/herself and another specific one (usually the parent) — a tie that binds them together in space and endures over time (Ainsworth, Bell, & Stayton, 1974). Bowlby's (1969) Attachment Theory has become the dominant theory used today in the study of infant and toddler behavior and in the fields of infant mental health and treatment - many evidence-based treatment approaches are based on applications of attachment theory. According to Bowlby (1969), attachment is a lifelong phenomenon and still more scientific evidence points out the role of attachment in current close relationships (e.g. Fraley & Shaver, 1998).

Bowlby (1973) describes a number of attachment styles, based among other things on proximity seeking behaviors in times of need. When the primary attachment figure successfully meets the needs of an infant, a sense of security and safety is attained, allowing the infant to explore the environment with open mind. However, if the attachment figure turns out to be unavailable and unresponsive, one will seek for other ways to deal with distress. Depending on early experiences with primary caregivers and their perceived availability, it is proposed that these habits of dealing with distress and sorrow are internalized as working models. These cognitive schemata, characterized as a system of thoughts, memories, beliefs, expectations, emotions, and behaviors about the self and others, shape our expectations about relationships throughout life and influence behavior in current relationships (Fraley & Shaver, 1998). In particular, it is expected that early experience with a caregiver who is sensitively and appropriately responsive to one's needs results in secure attachment, which is carried forward into adulthood via an internal working model of oneself as worthy of care and support. Conversely, early perception of the primary caregiver as unresponsive or unavailable results in insecure attachment, which later leads to a model of the self as unworthy or unable to rely on interpersonal support of significant others (Haaga et al, 2002). Adults are assumed to hold working models that may be based, in part, on the early life experiences and these models are thought to be incorporated in and influencing the later relationships with significant others (Carnelley, Pietromonaco, & Jaffe, 1994).

The dyadic classification of secure versus insecure attachment cannot explain the large differences in attachment behaviors within the insecurely attached group. Therefore, subcategories of attachment have been distinguished. Following the results of the 'strange situation experiment' (Ainsworth, Blehar, Waters & Wall, 1978), Bartholomew (1994) identified four types of attachment styles concerning adults, based on an individual's positive

or negative model of the self or other people. These subcomponents (models) refer to positive or negative schemas that contain information about one’s capacity and expectations of others in relational settings. The assumption is that while models of self and other tend to be complementary, they can also vary independently of one another. Therefore for example, one can have a positive model of the other and a negative model of the self.

The four attachment styles based on the possible four different combinations of positive and negative models of self and others consist of secure attachment (positive model of the self and others), preoccupied attachment (negative model of the self, positive model of others), fearful attachment (negative model of the self and others) and dismissing attachment (positive model of the self and negative model of others). The fearful, preoccupied and dismissing styles can be categorized as the insecure attachment styles (Bartholomew, 1994).

Although researchers often use categorical labels for the four attachment styles, according to Fraley and Waller (1998), there are no isolated (“pure”) categories or types within this conceptual space and people are actually distributed in a roughly bivariate normal way in the two-dimensional space defined by attachment anxiety and avoidance.

Anxious attachment reflects worry about being abandoned or rejected by others, and avoidant attachment reflects discomfort with close relationships and depending on others. Securely attached and dismissive attached individuals are both low in attachment anxiety but the former style reflects little avoidance, whereas the latter style reflects high avoidance. Preoccupied and fearful attachment style are both characterized by high anxiety, but differ in avoidance – preoccupied and fearfully attached individuals are low and high in attachment avoidance, respectively (see Figure 1).

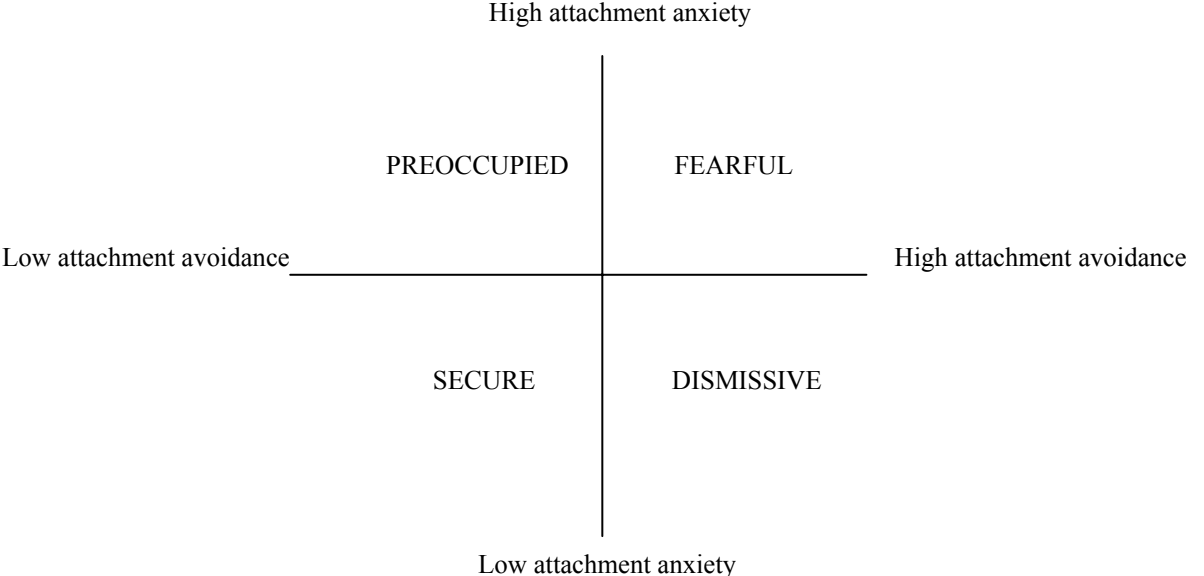


Figure 1. Illustration of the two-dimensional model of attachment styles.

The here above mentioned internal working models are defined as sets of conscious and unconscious rules for the organization of attachment information and for accessing that information (Main, Kaplan, & Cassidy, 1985) and these working models are thought to shape how adults interpret and respond to their social interactions. From working models-point of view, attachment styles can be characterized as organizational rules that guide responses to distress (Dewitte, Koster, De Houwer & Buysse, 2007). In potentially threatening situations, individuals with different attachment styles will react differently, using hyperactivating or deactivating strategies (Main, 1990, Mikulincer & Shaver, 2003), which correspond with attachment anxiety and avoidance respectively. Hyperactivating strategies are characterized by an excessive desire for closeness, preoccupation with cues of attachment figure's unavailability, and amplification of threat appraisals, causing chronic activation of the attachment system. These strategies are a distinctive feature of anxiously attached individuals. In contrast, deactivating strategies include denial and inhibition of attachment needs, which results in deactivation of the attachment system and excessive self-reliance in coping with distress. Because any thoughts about threat might re-activate the attachment system, threatening cues, such as attachment-related images or words are chronically being avoided (Dewitte et.al, 2007). These avoidant strategies involve suppressive and repressive mechanisms that lead to the dismissal of threat- and attachment-related cues and are supposed to be typical for avoidant attached individuals (e.g. Fraley & Shaver, 2000).

As Mikulincer and Shaver (2003) have found, attachment has a crucial role in affect regulation and cognitive functioning through selective processing of relevant information. Noticeably, in an experimental study of anxiously and avoidantly attached children, Kaplan and Cassidy (1985) found that both attachment groups ignored attachment-related pictures. Also Dewitte et al. (2007) found the same attentional bias away from the threatening stimuli (attachment related words) in adults. They investigated selective attention for general threat words (such as death, dangerous, painful) as well as attachment-related threat words (such as separation, rejected, ignored) as a function of attachment style using the dot-probe task and they discovered attentional avoidance of attachment-related threat in avoidant and anxious individuals. These results are different from the hypotheses in the hyperactivation theory, which assume anxiously attached individuals to pay extra attention to threatening stimuli, in this case attachment-related pictures.

Fitting in this direction, Rowe and Carnelley (2003) compared securely and avoidant primed subjects in a free-recall test using attachment-related stimuli. Specifically, they primed the subjects with relational schemas characterized by different attachment styles by letting the

subjects write about their (previously listed) attachment figure for ten minutes. Results showed that secure primed individuals recalled more positive attachment words than avoidants and, contrary to the deactivating findings stated above, remembered significantly less negative stimuli.

Also Edelstein and Gillath (2008) indicate in their study that avoidantly attached individuals can inhibit attention to negative and positive attachment-related material, which results in a reduction of the emotional Stroop interference effect. In their task, a series of words was presented on a computer screen in one of four colors (blue, green, yellow, or red). Participants were instructed to indicate, as quickly as possible, the color of each word by pressing the corresponding key on a response box. The used stimuli were emotionally loaded (positive and negative) attachment-related and attachment non-related words (see Table 1 for examples of used words).

Table 1. Examples of used words (Based on Edelstein and Gillath, 2008)

<i>Positive emotional</i>	<i>Negative emotional</i>	<i>Positive attachment</i>	<i>Negative attachment</i>
Beauty	Cruel	Adore	Abandon
Heaven	Curse	Affection	Alone
Liberty	Nasty	Embrace	Hurt
Paradise	Wicked	Depend	Lonely
Wisdom	Ugly	Trust	Divorce
Wealth	Tired	Support	Reject

The theories about the exact form of the attentional bias are sometimes opposing each other, but one way or the other; we can state that insecurely attached individuals seem to process attachment-related stimuli differently from securely attached individuals.

One of the numerous manifestations of attachment is crying. Being an attachment behavior triggered in infancy by separation (Bell & Ainsworth, 1972; Wolff, 1969) and throughout life by loss (Bowlby, 1969; Nelson, 1979), crying helps to establish and maintain the attachment tie between infants and their caretakers, as it continues to be a coping mechanism throughout life, when the position of caregivers is filled in by significant others (Nelson, 1996). When crying is activated by separation and no reunion takes place, both animals and humans from infancy into old age exhibit the more prolonged distress of grief (Bowlby, 1973, 1980, McPhee, 1994, in Nelson, 1996). Crying has also a survival function – when threatened by physiological vulnerabilities such as hunger, pain or illness, a crying individual can ask for attention and help in a manner everyone will understand.

But, besides pain, separation and loss, for adults there are more ways to induce crying. For example, happy endings, reunions, victories and other achievements tend to touch adults

in a specific and intimate way, and cause crying moments (Nelson, 1998). Research has shown that music also is a way to trigger emotions such as chill (Grewe et al. 2005), pleasant feelings and other modifications of mood (North and Hargreaves, 1997, Sloboda and Deliege, 1997, Storr, 1992). As pointed out by Sloboda (1991), music can arouse an emotional response of intensity rarely experienced in everyday life.

Music-induced crying as an attachment behavior has been investigated by Laan, Vingerhoets and Schaafsma (manuscript in preparation). In a survey study they asked participants to describe their last crying episode when listening to a song. This study has shown different crying behavior dependent on attachment styles. For example, the preoccupiedly attached individuals showed longer duration in crying and cried with a higher intensity. The dismissively attached group, on the other hand, cried significantly less, with less intensity and reported a less recent episode of crying when listening to music. As a result of this research, a chart of participant's "croon songs" emerged, classified per attachment style and these attachment-specific top-ten lists differed from each other.

So far, there are no hints about the relationship of attachment and musical preference. The fact that the top-ten songs differed per attachment style postulates that there may be yet uninvestigated causes in one of the musical dimensions – lyrics. As stated in the manual of the Adult Attachment Interview (Main & Goldwyn, 1994), subjects with different attachment styles tend to differ in verbal expression and discourse style. Buchheim and Mergenthaler (2002) described these differences as follows: *secure-autonomous* subjects talk freely about positive and negative emotional experiences and their narrative is coherent, open and fresh. *Dismissing* subjects avoid talking about emotional experiences. They provide incoherent, incomplete or contradictory accounts and show lack of recall and tend to idealize or devalue attachment figures. Characteristically, they deactivate attachment-related information. *Preoccupied* subjects give incoherent, inconsistent and endless accounts of their childhood. They present a lot of detailed memories and appear to be emotionally over involved with past conflicts. They tend to hyperactivate attachment-related information.

Mental representations of attachment are thought to direct not only feelings and behavior, but also cognitive processes such as attention and memory (Main, 1999; Main et al. 1985). Due to filtering of incoming information by the tacit organizational rules of the internal working model, attention is directed toward information that fits the representation. Attachment-related information that as a result of its content does not fit the expectancies is excluded (Bowlby, 1980). Possibly, this could be the reason why particular songs make only some people cry and not others.

The aim of the current study was to investigate linguistic differences in croon songs lyrics of individuals with different attachment styles. Following the attachment theories described above and basing our expectations on Main's (1990) hyperactivation theory we could assume that securely attached individuals will be touched by song texts that include (positive) attachment representations, such as the child-parent relationship, and that anxious individuals, both fearful and preoccupied, will be brought to tears by texts referring to negative attachment schemas, such as emotional abandonment. The first hypothesis emerges: anxiously attached individuals will most often cry when listening to "threatening" lyrics. Threatening lyrics in this case are song texts that refer to desire for closeness, preoccupation with cues of attachment figure's unavailability, and amplification of threat appraisals (such as fearful, worry, abandon, hate, love, and mother). Therefore, the anxious top-ten croon songs will contain more negative emotion words than the croon songs of securely attached participants, whose songs will in contrast contain more positive emotion words.

In hypothesis two, a reverse effect will be expected in the avoidantly attached top-ten. According to Mikulincer and Shaver (2003) and Buchheim and Mergenthaler (2002), avoidantly/dismissively attached individuals should use deactivating strategies when exposed to threatening stimuli, which means paying less attention to it, and therefore it is hypothesized that the avoidant crying top-ten will contain less "threatening" (=positive and negative) attachment words than anxiously attached individuals.

The third hypothesis concerns the reasons that securely and preoccupiedly attached individuals cried at specific songs. Miller (2001) tested the relationship between attachment models and recall of an unfamiliar peer's conversational remarks. She declared that people with positive model of others remember more from their social interactions. As stated above, securely and preoccupiedly attached individuals have a positive model of (significant) others. If we consider a song as a form of social interaction, we could assume that individuals with these two attachment styles will, when asked this question, consciously judge songs by beauty of their lyrics more often than the other two groups. Therefore, securely and preoccupiedly attached individuals will judge their songs by appreciating the beauty of the text more often than the other two groups.

3. Method

Participants

This internet-survey study was carried out with 3032 Dutch radio listeners (38% male, 62% female) who responded to an appeal made on a national radio station. The average age of men was 37.91 years (SD 12.43); participating women were on average 36.31 years old (SD 11.92). The youngest participant was 12 years young and the oldest participant 68 years old.

The distribution of the highest education attainment level in this sample was left-skewed. Two hundred ninety participants (9.6%) had attended elementary and low-level vocational education, 1173 participants (38.7%) had middle level vocational education, 1073 (35.4%) of the participants had attended higher professional education and 496 (16.4%) completed university education.

Procedure

Radio listeners who were interested in participating in the study visited a public radio website. They were then redialed to an open-access website where they could - after a short instruction – fill in the researcher’s questionnaires anonymously. The duration of completion was approximately 20 minutes.

Materials

This study was carried out as a part of a larger study. Aside from a number of demographic questions about sex, age, education level and musical affinity, participants completed a set of three questionnaires.

Adult attachment.

The Dutch version of the Relationship Questionnaire (RQ, Griffin & Bartholomew, 1994) was used to assess individual attachment differences. The RQ is a frequently applied brief self-report measure of adult attachment behavior. It contains descriptions of the four attachment prototypes (secure, fearful, preoccupied, and dismissing). Participants rated how accurately each prototype (not labeled as the construct measured) described their overall experience in romantic relationships on a seven-point scale ranging from 1 (*does not describe me at all*) to 7 (*describes me very well*). When rating themselves on these scales, the individuals provide a profile of their attachment feelings and behavior. The highest of the four attachment prototype ratings can be used to classify participants into an attachment category,

but when there are more styles rated the same way, a problem emerges. To deal with this, in the last item the participants were asked to choose the best fitting attachment pattern. Despite of the fact that the RQ is a very brief instrument, ratings of the four attachment patterns using the RQ have shown moderate stability over an 8 month test re-test period (Scharfe & Bartholomew, 1994). There is also evidence of substantial convergence with other, similar self-rating measures of attachment style (Carver, 1997).

Additional Questions about crying when listening to music.

A further questionnaire was developed to assess other crying behavior (for example: *How often have you cried in the past four weeks?*). Also, the last crying episode when listening to music was questioned (for example: *When was the last time you have cried when listening to music? Were you alone? How long was the crying episode? Which song were you listening to? What about the song made you cry?*). For the current study only the item about the reason of crying (*What about the song made you cry?*) was used.

To analyze song lyrics, *Linguistic Inquiry and Word Count* (LIWC, Pennebaker, 2001) was used with the Dutch dictionary for Dutch lyrics and the English dictionary for English lyrics. LIWC is a computer program that was developed to analyze text on a word-by-word basis by means of automatically classifying words in 66 categories which are split in five dimensions: linguistic processes, psychological processes, relativity, personal concerns and spoken categories. The internal reliability statistics vary from .55 (uncorrected, percentage method) to .92 (corrected, binary method), where the uncorrected method tends to underestimate the reliability and the corrected method to overestimate the LIWC's reliability (Pennebaker, Booth & Francis, 2007). External validity was tested by performing comparative analyses of human judge's ratings and LIWC ratings. The Pearson's correlation between these ratings (ranging from .07 to .87, in the single categories and .45 on average) reveals that the external validity of this instrument is moderate (N=72, Pennebaker & Francis, 1996). The overall internal reliability of the Dutch version (Zijlstra, Middendorp, Meerveld & Geenen, 2005) was .60 and the overall test-retest reliability, the Spearman-Brown correlation, was .43. When the two versions were compared, 89% of the correlation scores per category was high ($.50 < r \leq .70$) or very high ($.70 < r \leq .99$) (Zijlstra et al., 2004). In our study, the categories "positive emotion words" (405 words such as "loving", "luck", "value" and their extensions) and "negative emotion words" (495 words such as "lies", "doom", "wicked" and their extensions) were used.

Additionally, an adjusted LIWC dictionary (English as well as Dutch) was developed, which focused only on positive and negative attachment words. This dictionary was based on previous research of Dewitte and colleagues (2007) and Edelstein (2006) and contained attachment-specific vocabulary that extended the former categories of positive and negative emotional words. The additional dictionary was made by two independent researchers who sought for synonyms of the in total 28 positive and 28 negative attachment-related words from Dewitte and colleagues (2007) and Edelstein (2006) and subsequently translated these words in Dutch. The double entered words were deleted and the final version of the additional dictionary included 310 English (127 positive such as “nourish”, “infatuate”, 183 negative such as “scare”, “neglect”) and 210 Dutch (91 positive such as “geborgen”, “hartelijk”, 119 negative such as “leed”, “negeren”) attachment-related words.

The top-10 song lyrics of each style were transcribed at verbatim and analyzed by the LIWC in order to obtain information about the used word categories. The analysis was focused on emotion-related and attachment-related words. All data were analyzed using SPSS for Windows. To examine whether the croon songs of the anxiously attached groups contained more negative and less positive emotion words than the croon songs of securely attached group (hypothesis 1) and to examine whether the croon songs of dismissively attached individuals contained less positive and negative attachment words than the croon songs of anxiously attached individuals (hypothesis 2), an ANOVA with LSD Post Hoc test of the difference of means was used. The attachment style category was the independent variable and the number of positive and negative emotion and attachment words were the dependent variables. Because of a small probability of correlational significance due to small N, effect sizes (Cohen’s *d*) were computed to express the strength of the relationship between attachment style and the occurrence of emotion and attachment words in songs. According to Cohen (1980), the value of $d > 0.2$ is a small effect, $d > 0.5$ is a moderate effect and $d > 0.8$ is a large effect.

To examine whether the securely and preoccupiedly attached groups were more often touched by the lyrics of their croon songs than the two anxiously attached groups (hypothesis 3), a chi-square test was performed with the attachment style as independent and the answer categories as dependent variables, because of the nominal level of the variables.

4. Results

Preliminary analysis

At first, a preliminary analysis of the attachment styles distribution was carried out. For the purpose of this study, the last question in the RQ (the best fitting attachment pattern) was used to assess a participant's attachment style. This analysis revealed an expected distribution of the four styles: 48.4% (1467) of the participants were securely attached, 24.1% (732) fearful, 10.2% (310) preoccupied and 17.2% (523) dismissively attached. These data match the division of attachment styles in the normal population found in attachment research studies (for example Bartholomew & Horowitz, 1991).

The further analysis was focused on emotion- and attachment-related words and, in hypothesis 3, the relationship of attachment style and participant's appreciating of the beauty of the lyrics versus the beauty of the music. The lyrics of each top-ten song were processed by the LIWC and then statistically analyzed. The frequency of some in the hit chart low-ranked songs was quite low (2 in the preoccupied and 3 in the dismissive top-10). Because there were 18 of them in the preoccupied and 10 of them in the dismissive chart, we have decided not to include these not-so-often named songs in the top-10. Also, in the fearful top-10, four songs, placed on the 9th to 12th rank, had the frequency of 5, which means that there are 12 top croon songs in this style. The lowest frequency for a top-croon song was nine in the secure, five in the fearful, three in the preoccupied and four in the dismissive top-list of croon songs. Three songs were excluded from the analysis because of the language – there was no LIWC dictionary available for Latin and Italian language. This brings the total number of croon songs to 36; 10 songs for the secure style, 11 for the fearful style, 6 for the preoccupied style and 9 for the dismissive style. There were 24 different songs (16 English and 8 Dutch songs) and some of the songs appeared in more than one top-10. One song was even present in all four charts. Table 1 presents the 36 top croon songs divided per attachment style.

Table 1. *The top-croon songs grouped by attachment style.*

Nr	Secure	Fearful	Preoccupied	Dismissive
1	Avond (B. de Groot) 20x	Papa (S. Bos) 16x	Avond (B. de Groot) 6x	Papa (S. Bos) 8x
2	Papa (S. Bos) 18x	Ik heb je lief (P. de Leeuw) 7x	Who wants to live forever (Queen) 4x	Comfortably numb (Pink Floyd) 7x
3	Afscheid nemen bestaat niet (M. Borsato) 13x	Music (J. Miles) 7x	Ave Maria (Il Divo) 3x	Geen kind meer (K. Bloemen) 6x
4	Hurt (Ch. Aguilera) 13x	Afscheid nemen bestaat niet (M. Borsato) 6x	Geen kind meer (K. Bloemen) 3x	Hurt (Ch. Aguilera) 5x
5	Voor haar (F. Halsema) 11x	Avond (B. de Groot) 6x	One word (Anouk) 3x	Love of my life (Queen) 5x
6	Geen kind meer (K. Bloemen) 10x	Geen kind meer (K. Bloemen) 6x	Speeltuim (M. Borsato) 3x	Wish you were here (Pink Floyd) 5x
7	You'll never walk alone 10x	One (J. Cash) 6x	True colors (C. Lauper) 3x	Avond (B. de Groot) 4x
8	De vlieger (A. Hazes) 9x	Tears in heaven (E. Clapton) 6x	Voir un ami pleurer (J. Brel) 3x	Nothing compares 2 U (Sinead O'Connor) 4x
9	Love of my life (Queen) 9x	Angels (R. Williams) 5x		One (U2) 4x
10	The family tree (Venice) 9x	At seventeen (J. Ian) 5x		
11		Love of my life (Queen) 5x		
12		Vivo per lei (A. Bocelli) 5x		

Hypothesis 1: Croon songs of anxiously (fearful and preoccupied) attached individuals will contain more negative and less positive emotion words than croon songs of securely attached participants.

The difference between attachment styles on positive and negative emotion words was not significant (positive: $F(3, 1) = 1.27$; $p = 0.30$; negative: $F(3, 1) = 1.22$; $p = 0.32$). However, using Cohen's d for effect sizes showed (see Table 2) that the croon songs of anxious individuals contained less negative and more positive emotion words than those of securely attached individuals, and these differences were large.

Concerning the difference between the dismissive group and the anxious groups in negative words, the songs of both anxious groups contained more negative emotion words than the songs of the dismissive group. In fact, the croon songs of the secure group contained the most negative emotion words and the least positive emotion words.

Table 2. Means and standard deviations for the use of positive and negative emotional words in the top-10 croon songs of the four attachment styles, and Cohen's *d* effect sizes for the differences in emotional word use between the attachment categories.

	Positive emot. words		Negative emot. words		<i>d</i> positive emotions	<i>d</i> negative emotions
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Secure	2.32	1.90	3.00	2.39		
secure-fearful					-0.83	0.73
secure-preocc.					-0.62	0.62
secure-dism.					-0.44	0.13
Fearful	4.48	3.14	1.71	0.76		
fearful-preocc.					-0.13	-0.07
fearful-dism.					0.48	-0.62
Preoccupied	4.06	3.49	1.79	1.39		
preocc.-dism.					0.30	-0.51
Dismissive	3.20	2.15	2.70	2.12		

Note. The abbreviations used in this table: attach.= attachment, emot.= emotion, preocc.= preoccupied, disp.= dismissive.

Hypothesis 2: Croon songs of avoidantly (dismissively) attached individuals will contain less “threatening” (=positive and negative) attachment words than croon songs of anxiously attached individuals. The difference between attachment styles on positive and negative attachment words was statistically not significant (positive: $F(3, 1) = 0.47$; $p = 0.71$, negative: $F(3, 1) = 0.96$; $p = 0.42$). Using a Cohen's *d* effects analysis we obtained the following results (see Table 3): the songs of the fearfuls contained less negative attachment words than those of the dismissive group, which was a large effect. Between the dismissive and the preoccupied group, small effect sizes were found for positive as well as negative attachment words (-.25 and -.11, respectively), indicating that dismissives used slightly more positive and negative attachment words than preoccupiedly attached individuals.

Table 3. Means and standard deviations for the use of positive and negative attachment words in the top-10 croon songs of the four attachment styles, and Cohen's *d* effect sizes for the differences in attachment-related word use between the attachment categories.

	Positive attach.words		Negative attach.words		d positive attach.	d negative attach.
	M	SD	M	SD		
Secure	1.49	2.01	2.67	1.98		
secure-fearful					-.45	.64
secure-preocc.					-.20	.04
secure-dism.					-.41	-.08
Fearful	2.54	2.62	1.61	1.22		
fearful-preoc.					.32	-.48
fearful-dism.					.10	-.88
Preoccupied	1.86	1.57	2.59	2.59		
preocc.-dism.					-.25	-.11
Dismissive	2.32	2.07	2.81	1.48		

Note. The abbreviations used in this table: attach.= attachment, emot.= emotion, preocc.= preoccupied, disp.= dismissive.

Hypothesis 3: Securely and preoccupiedly attached individuals will judge their songs by appreciating the beauty of the text more often than the other two groups.

The difference between the attachment groups on the issue of appreciating the beauty of the text was not significant ($\chi^2 = 1.94$; $df = 3$; $p > 0.05$). There is no evidence that the secure and preoccupied groups appreciated croon song lyrics more often than the other two groups (see Table 4).

Table 4. Cross tabulation of the different answers of the question "What about the song had made you cry?" grouped by attachment style.

	Beauty of the text		Other reason	
	N	%	N	%
Secure	260	17.8	1197	82.2
Fearful	134	18.4	593	81.6
Preoccupied	55	17.9	252	82.1
Dismissive	81	15.5	440	84.5
Total	530	100	2482	100

5. Conclusion

In this study, we investigated music-induced emotion, in particular crying, in relation to word use and attachment style. According to our results, the croon songs of anxiously (both fearfully and preoccupiedly) attached individuals contained less negative and more positive emotional words than the croon songs of securely attached individuals. The croon songs of dismissively attached individuals who are characterized by low attachment anxiety and high attachment avoidance contained in general more positive and negative attachment words than the croon songs of the two anxious groups.

As Main (1990) found in her research, mental representations of attachment seem to affect not only feelings and behavior, but also cognitive processes such as attention. This happens for example by filtering of incoming information. Based on Main's (1990) Hyperactivation Theory, our first hypothesis stated that croon songs of anxiously attached individuals (fearfully and preoccupiedly) would contain more negative and less positive emotion words than croon songs of securely attached participants. This hypothesis was not supported by the results. Although there was a moderate to large effect of the difference in the amount of positive and negative emotion words between the anxious and the secure group, the results pointed exactly the other way around than expected. The songs of anxiously attached individuals contained less negative and more positive words than the songs of securely attached individuals. We will consider possible reasons for the fact that these results differ from the theoretical assumptions lined out in the introduction. First, as Laan & Vingerhoets (manuscript in preparation) have found, anxiously attached individuals cry more often, with longer duration and greater intensity than the other two attachment styles. This might signify that the anxiously attached participants are more sensitive to (positive and negative) threatening cues and do not need a lot of these cues to feel touched or to start crying. This fits in with Nelson's theory about the low crying threshold for anxiously attached people (Nelson, 1996). It seems as if their emotional regulation is different from the emotional regulation in securely attached individuals. Anxious attached individuals seem to intensify emotions that call for attention, care for emotions that emphasize vulnerability and neediness and express more negative affect than both dismissively and securely attached individuals (Laan & Vingerhoets, *manuscr. in prep.*). This idea is also consistent with the claims of Mikulincer and Shaver (2003) that attachment-anxious individuals, who chronically rely on hyperactivating strategies, tend to exaggerate their vigilance for threatening aspects of the environment and

are more alert for them. Our findings are more in accordance with this alternative theory that states that anxiously attached individuals are more easily touched by emotional cues, either positive or negative, than securely attached people.

The second hypothesis stated that avoidantly (dismissively) attached individuals will contain less positive and negative attachment words than the songs of anxiously attached individuals. This expectation was based on research where avoidantly attached individuals showed attentional bias to threatening stimuli, such as positive and negative attachment words (Mikulincer & Shaver, 2003; Buchheim & Mergenthaler, 2002). This hypothesis was not supported by our results. More specifically, we found that the songs of the dismissive group contained considerably more negative attachment words than those of the two anxious groups, and more positive attachment words than the songs of the preoccupiedly attached group. There are a few explanations for our contrasting findings. As stated above, according to Mikulincer and Shaver (2003), preoccupiedly attached individuals might not need many cues to feel touched. This could account for the fact that the songs of preoccupiedly attached subjects contained less cues than those of the dismissives. A second explanation corresponds with a different view of the attentional bias mechanism in dismissives. It might be that due to the suppression of the threatening cues, more cues will be needed to make the individual cry and therefore the croon songs of the dismissives contain more of these cues. The third explanation is linked with the findings of Zimmerman and Spangler (1999) about interpretation of stimuli in dismissive individuals. They found that dismissive respondents reported more positive interpretations for both positive and negative stimuli (film scenes). This may indicate a tendency in dismissively attached individuals to positively interpret negative indications, or a restricted ability to perceive negative emotions. This could explain why the amount of positive and negative attachment words in their croon songs was not consistent with our hypotheses. Fourth reason for the different results of our study and the study of Edelstein and Gillath (2008), which we used for creating a theoretical base for our study, could be the methodological differences. In their study, Edelstein and Gillath (2008) used the emotional Stroop task to investigate whether avoidant individuals limit attention to emotional stimuli with attachment-related themes (e.g., intimacy, rejection). In our research, free recall of songs (and lyrics) was required. As Juslin and Laukka (2004) state in their research, the response variability is greater when using free description than when the participants are forced to choose an option. Depending on the process of emotion expression, the underlying mechanisms in a Stroop test may be different than at a free recall and this may make the results vary. However the second hypothesis was not supported by our

results, a number of possible theoretical explanation was found to account for this discrepancy.

The third expectation – that securely and preoccupiedly attached individuals will judge their songs by appreciating the beauty of the text more often than the other two groups – could not be proven in our research. There was no evidence that the secure and preoccupied groups more often chose a croon song because of its lyrics than the other two groups. Potentially, the lack of findings in the expected direction is caused by the indistinct formulation of the answer options in the relevant item. The answer categories were not clear enough to enable distinct answer options. For example, the answer options “feelings of nostalgia” and “thinking of a happy event” might be too similar to differentiate. Also, the term nostalgia was not defined in the questionnaire, and participants could have confused these two answers. The answer option “being touched by the lyrics” could have been confused with one of the other options because it is not specified whether being touched corresponds with a (happy or sad) personal event. Concluding, the item answers did not exclude each other, which could have been the main methodological problem. Further research with better methodology is required to review this hypothesis.

6. Strengths, limitations and implications

The strength of our study is the relatively large sample. Because of the great number of participants, possible generalizing of the results to a broader population has become sounder. Also, this study is the first by the researchers known study in the investigation of crying in relation to word use and attachment style. This study has shown some indirect, but practical ways of research on attachment in daily life. The use of a computerized program to analyze the lyrics may be used instead of a time-consuming pen-and-paper procedure in analyzing general word use of individuals with different attachment styles, for instance when being assessed on the Adult Attachment Interview. Although our findings are encouraging because they show some consistent differences in croon song lyrics depending on attachment style, methodological limitations should be considered when interpreting the results. The impact of the use of an internet survey could be double-sided. Due to its anonymity, participants will probably tend to disclose personal information more easily than in, for example, a structured interview. On the other hand, the anonymity of internet could have tempted some participants to fill in the questions in a careless manner, which could have negatively impacted on reliability of the information provided. Also, the personal information given by participants on the internet could have been false and this could have had negative effect on the usefulness of the sample data. Another possible deficit of the present research is that some of the studies that form the theoretical base of it are contradictory to each other, which makes this study quite explorative.

The present findings may serve as a preliminary study and an impulse for further research in the direction of the influence of language aspects within attachment. The differences in the frequency of positive and negative attachment words could explain some of the differences in the internal working models – the important aspect of emotion regulation. Dismissive attached people probably need more positive and negative words to activate their attachment system, whereas preoccupied individuals only need a few of these cues.

It might be useful to investigate the possibility of using different song lyrics within nonverbal therapies, such as music-therapy, where the song lyrics will be “attuned” to a person’s attachment style. Many of the top-10 croon songs had a similar theme: parent-child and partner relationships. This could be used in therapy as working material to discover more information about a person’s feelings and thoughts about these kinds of relationships. The importance of this rests in the fact that primary relationships influence a person’s further social interactions and also possible disorders in this field.

The next step could be commercial use of this kind of research in promotion and PR with the aim of predicting subject's tendency to like or dislike particular products when the commercial or advertisement will contain particular lyrics or words. More research is required to investigate the possibility of commercial use of language within attachment.

Evaluating this study, we could state that even though the results could not support our hypotheses, they have shown some association between attachment styles and lyrics of croon songs. Although the results were not significant when conducting an ANOVA, an analysis of the effect sizes (Cohen's *d*) has shown moderate to large effect of the difference in croon-songs lyrics between the four attachment styles. The most valuable theory in explaining the results turned to be the attentional-bias theory from Mikulincer and Shaver (2003).

7. References

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