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### Bits of emotion

*The process and outcomes of sharing emotions online*

Rodríguez Hidalgo, C.T.

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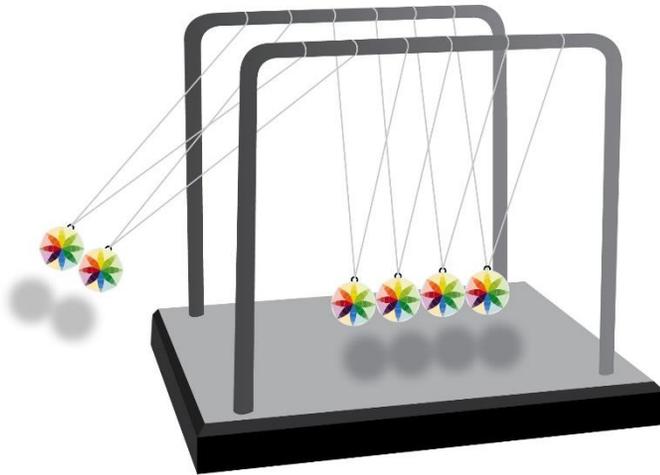
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## Chapter 2

# The social sharing of emotion (SSE) in online social networks: A case study in Live Journal



### **Abstract**

Social sharing of emotion (SSE) occurs when one person shares an emotional experience with another and is considered potentially beneficial. Though SSE has been shown prevalent in interpersonal communication, research on its online occurrence and communication structure is lacking. We present a theoretical model of a basic three-phased cycle of online SSE, based on a content analysis of Live Journal blog posts ( $n = 540$ ). A large proportion of emotional expressions were found to conform to the definition of SSE, with negative emotion posts outnumbering bivalent and positive posts. Affective feedback predominated to cognitive, providing emotional support, empathy and admiration. The study testifies that full cycle SSE occurs in Social networking sites (SNSs), contributing to pro-social forms of online emotional exchanges.

Sharing emotions is a human need, particularly in the case of strong emotions (Derks, Fischer, & Bos, 2008). However, when you have just gone through an emotional experience, will it actually make you feel better to share your feelings with other people? The Social Sharing of Emotion framework (SSE; Rimé, 2009) states that under specific conditions, long-term beneficial effects can be achieved by communicating emotional experiences to others. Although the process and effects of SSE have been studied in face-to-face (FtF) communication, little is known about SSE in online environments. This is surprising, as Social Networking Sites (SNSs) abound with displays of emotion (Manago, Taylor, & Greenfield, 2012; Zafarani, Cole, & Liu, 2010). Furthermore, several studies have shown that emotional valence plays an important role in the sharing and diffusion of emotions in SNSs (Choi & Toma, 2014; Sas, Dix, Hart, & Su, 2009).

Given the profuse emotional sharing that takes place in SNSs, an important question is to identify the character of these expressions, and understand which emotional functions may be taking place behind these exchanges. Two main conflicting views can be mentioned to explain this problematic. On the one hand, societal and media accounts have deemed SNSs communication to be mostly superficial, compared to FtF communication. Favouring this argument, studies have found SNSs communication to foster positive impression management strategies and/or satisfy needs of social grooming, gossip, people-curiosity and small talk among its users (e.g., John, 2013; Utz & Beukeboom, 2011; Quan-Haase & Young, 2010).

On the other hand, emotional disclosure has been found to be an important function behind SNSs use (Manago et al., 2012). Since SSE entails a particular type of emotional disclosure, which expresses and describes the emotional event and feelings to another person in detail (Rimé, 2009), we can assume that SNSs may represent an ideal venue for expressing SSE to recipients known to the experiencer, at least to some extent. This evidence favors a more meaningful view with respect to emotion sharing in SNSs.

This lack of clarity with regard to the nature of emotional exchanges in SNSs, highlights the necessity of identifying whether these profuse emotional expressions in SNSs correspond to SSE, or are mere 'venting' of emotions. Via a content analysis of blog posts, this study classifies emotional expressions in Live Journal in different types of SSE, and assesses their occurrence in the platform. Additionally, and adapted from Rimé's FtF SSE model (2009), this paper proposes a general *communication structure* of online SSE, with the aim to provide a foundation to understand its process and functions. Key to this structure, is the feedback to initial sharing in SSE, and whether it conforms to beneficial requirements as proposed by SSE theory. In this case, we would bring evidence to a pro-social form of online SSE.

## Theoretical framework

### Social sharing of emotion

Emotions result from an individual's interaction with the environment, and consist of sets of complex and synchronized component responses (Scherer, 2005). These responses may consist of physiological adjustments, feelings and motor expressions to act in one way or another (Moors, Ellsworth, Scherer, & Frijda, 2013). In interacting with their environment, individuals encounter obstacles to their important life goals, such as attachment or social belonging, bodily integrity and safety. Emotions of different intensity may arise when individuals experience a positive or negative disruption in the pursuit of their goals. This disruption can either be positive or negative, e.g., having unexpected good fortune or losing a family member. When a person experiences an episode that affects their emotional balance, the resulting emotions are quickly expressed to recipients close to that person, triggering a process known as SSE (Luminet, Bouts, Delie, Manstead, & Rimé, 2000). SSE is inherently interpersonal, requiring at least two persons who communicate, i.e.,: 1) the person who experiences an emotion, feeling an urge to affiliate and express it, and 2) the recipient of the emotional disclosure. SSE entails a description of the emotional episode in a language known to both persons, and is differentiated from venting, which is a simple verbalization or an outburst of an emotion (Nils & Rimé, 2012). Though sharing (especially negative) emotions may not be easy, it has been shown beneficial to do so, particularly when SSE is met with appropriate feedback (Rimé, 2009).

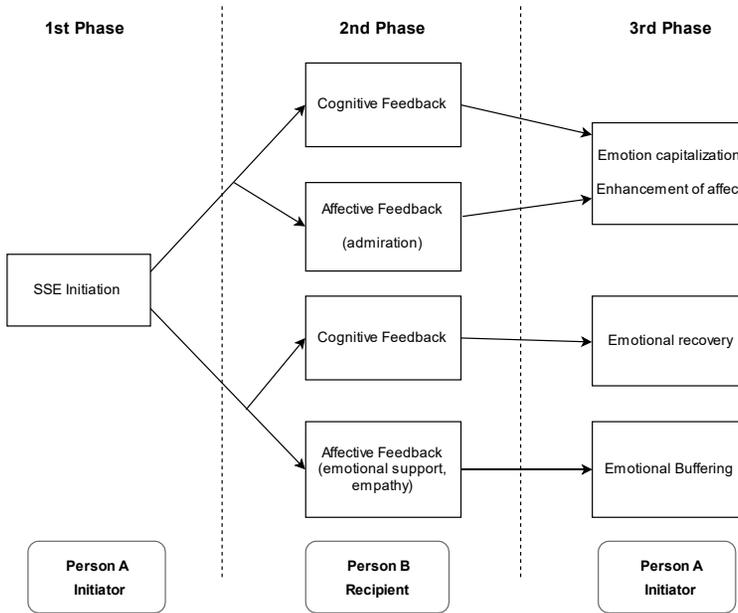
SSE is very prevalent in the wake of emotions; in at least 60% of cases people communicate emotions to others on the same day of an emotional episode. After one week, this percentage increases to 90% (Rimé, Mesquita, Boca, & Philippot, 1991). SSE has been found to occur regardless of emotion type, gender, age, culture and level of education, though with slight variations between these (Rimé, Finkenauer, Luminet, Zech, & Philippot, 1998).

### The basic social sharing of emotions cycle in online social networks

We investigate the presence of SSE in SNSs by presenting a basic cycle of SSE in SNSs, differentiated by the emotional valence of the shared episode (see Figure 1). The model identifies three main components in the SSE sharing cycle: SSE initiation, feedback to SSE initiation, and the initiator's reaction to the feedback. Because in Live Journal and other SNSs, the comment thread can include multiple posts and reposts from other recipients and the

initiator, we consider this three-cycle as the basic communication structure to conceive online SSE.

Figure 1. Basic communication cycle of the Social Sharing of Emotion in SNSs



**Live Journal and online SSE.** We examine our framework in the context of a social network site called Live Journal. Since its inception, Live Journal has reached more than 25 million users worldwide and it is still popular in the United States, although it is most popular in Russia, Ukraine and Belarus, where it is among the 20 most visited web sites (Alexa, September, 2014).

Live Journal allows for public or semi-public blog profiles and displays a visible list of friends. This list may be browsed by the blog author and by his or her friends, a core characteristic common to other SNSs (boyd & Ellison, 2007). Live Journal users can post reactions to each other’s blog posts in the form of comments, or a dated text entry within a blog profile. The typical structure of a Live Journal blog is similar to that of other SNSs, consisting of posts by A that can initiate a cycle, responses by B (or C, D...) and possible reposts by A in the same comment thread. We hypothesize that this structure facilitates online SSE by organizing interpersonal communication in three distinguishable phases: initiation, feedback, and reposts.



### First phase of online SSE: SSE initiation

In order to account for different types of SSE, this paper conceptualizes three different types of SSE initiating posts (ranging from a higher to a lesser degree of information sharing): full SSE, SSE experience and SSE feelings posts.

**Full SSE blogpost.** Initiation blog posts are considered *full SSE* when a subject expresses a) one or more concrete emotional situation involving a real-life event or person and the causes or circumstances explaining the emotional response, b) a specific labeling of the affect, that is a *feeling*. For instance: "I just saw a terrible car accident, I feel really shocked about it." (here "just saw" delimits and concretises the situation of the emotional experience, the terrible car accident is the cause, and "really shocked" the specific feeling label). Full SSE posts may be regarded as meeting the requirements to signal a need to be listened and receive feedback: the respondent can feel the initiator's need to be (emotionally) understood. Therefore, a full SSE sharing post is informative as to the specific emotion, its causes and the concrete situation.

**Partial SSE situation blogpost.** Refers to an emotional episode experienced by the initiator, without any explicit labeling of the particular affect, but it mentions the situation and the circumstance or cause. (e.g., "I just saw a terrible car accident").

**Partial SSE feelings blogpost.** Expresses a specifically labeled feeling, without describing a situation, circumstance or cause (e.g., "I'm shocked!"). This partial SSE feelings post equates to the mere 'venting' of an emotion, as defined by Nils & Rimé (2012).

**Non-SSE blogposts.** Contain no information about (a) the initiator's emotional affect, or (b) the emotional episode the initiator reports to have gone through. Hence, they are informative about a circumstance inconsequential for the poster's affect. An example of a non-SSE post would be: "President Obama arrived to the country yesterday amid great displays of security," while a full SSE post would read: "upset about the tight security around President Obama's arrival, all bus lines have been cancelled!." Our first research question refers then to the prevalence of the different types of initiating posts:

*RQ1: To what extent do the three types of online SSE occur in Live Journal?*

**Online SSE initiation: valence and intensity of the shared emotion.** SSE initiations can have a positive or negative valence, and may vary in their degree of intensity. The more intense the emotion in the individual, the stronger the urge of the individual to share it with others (Rimé, 2009). Negative valence SSE occurs when negative affect is expressed (e.g.,

sadness, anger, fear), often when a goal is not achieved. This goal may be as broad as achieving success or preserving the individual's emotional stability. Positive valence SSE occurs when positive affect is expressed, (e.g., happiness or contentment) with regards to a particular circumstance, situation or event. Rimé also proposes that positive emotions typically occur after success in reaching a certain goal. Additionally, bivalent valence expressions may occur in situations that evoke conflicting feelings. For instance, feeling happy about a friend getting a great job in another city, but simultaneously feeling sad that the friend is leaving town.

Regarding the question of which type of valence is most prevalent in SNSs, the literature seems to suggest predominantly that positive emotional valence prevails (e.g., John, 2013; Sas et al., 2009). This is not surprising, since sharing negative emotions in SNSs has been found to often occur via private messages, due to impression management concerns to share to a larger audience (Vermeulen, Vandebosch, & Heirman, 2014). However, blogs are a special case of online communication, because they are commonly employed as a kind of personal diary, in which users write about their most intimate or secret experiences, including unpleasant ones (Nardi, Schiano, Gumbrecht, & Swartz, 2004). Therefore, we can reasonably assume that Live Journal users would show a tendency to disclose more negative than positive experiences. These rather contradictory considerations regarding initiation valence lead us to our second research question:

*RQ2: To what extent do positive, negative and bivalent valence SSE occur in Live Journal?*

**Online SSE initiation: topic.** Online SSE can display a certain topic. Psychological research has posited that a set of specific life events can bring about positive or negative consequences for the affect of individuals (Rimé, 2009), such as unexpectedly winning something, or being the object of misfortune. It is still a question whether the same topics are part of SSE in SNS communication. Christophe & Rimé's (1997) study on social sharing used a list of important life events developed by Holmes & Rahe (1967). Based on this list, we formulate our third research question:

*RQ3: To what extent are important life events present in online SSE in Live Journal?*

### **Second phase of SSE: feedback to initiator**

Feedback is the response that recipients of emotion sharing provide to the initiator. Feedback plays an important role, as through feedback the initiator benefits most from SSE,

beyond the relieving effect of full SSE in the initiation phase. This benefit mainly consists on emotion regulation and recovery (Zech & Rimé, 2005). Two main types of feedback are recognized by SSE theory: affective and cognitive.

Affective feedback functions as a “buffer” of the initiator’s emotional experience, taking the shape of appeasement, comfort, love, care, availability, proximity, contact, support, esteem, validation, listening, understanding, unconditional support and integration (Rimé, 2009). In negative emotion sharing, the “buffering” function of affective feedback makes the initiator feel emotionally contained and reassured after a negative event. In positive emotion sharing, the contentment expressed by recipients serves the initiator to “relive” the positive experience and thus, experience a capitalization or surge of positive emotions. Although affective feedback serves a *temporary* alleviation or buffer function for the sufferer, it does not secure full emotional recovery (Rimé, 2009). For instance, if a musician were to fail during an audition, affective feedback would show empathic demonstrations of sadness and reassure the musician that “it will be alright” for the next audition, but it would not necessarily help the musician to prevent a similar situation in the future.

Cognitive feedback implies a rational effort on the part of the recipient in order to help the initiator cope with and recuperate from the emotional episode. Cognitive feedback occurs when the recipients of SSE stimulate the cognitive work of the initiator, causing them to actualize self-views, reorganize priorities, reaccommodate their models or views of the world, or reframe the episode (Rimé, 2009). An example of cognitive feedback would be telling the musician in the aforementioned example that the audition failed not due to his/her lack of musicality or talent, but due to excessive nervousness, and suggesting to seek advice on how to become more relaxed while on stage. By ultimately healing a loss of self-confidence, cognitive feedback has the potential of minimizing the negative impact of the experience in the long term.

In FtF communication, affective feedback occurs much more frequently than cognitive feedback, for at least four reasons (Rimé, 2009). Firstly, the immediacy of being a target to SSE triggers a desire in recipients to provide immediate affective comfort to the sufferer. Secondly, the anxiety of being exposed to a negative situation leads to a common underestimation of the other’s situation. Thirdly, initiators are often not ready to receive cognitive feedback just hours after the emotional event, and would rather be appeased and comforted. Finally, initiators often expect socio-affective more than cognitive feedback to take place when SSE occurs. In line with SSE theory, we propose:

*H1: In online SSE, affective feedback occurs more often than cognitive feedback.*

**Online affective feedback and valence.** Extending SSE theory, this study conceptualizes online affective feedback to online SSE to take three basic forms, depending on the valence of the initiator post. In the case of negative SSE, online affective feedback would mainly be given as emotional support and empathy, while feedback to positive online SSE would most likely take the form of admiration (Figure 1).

**Affective feedback to negative emotion: emotional support.** Emotional support expresses concern and esteem for another individual (Cohen & Wills, 1985) with the goal of relieving the emotional distress experienced by another person (Samter & Burleson, 1984). Common emotional support behaviors include inquiring about the experience and/or feelings of the initiator and expressing one's availability to further listen to the sufferer (Rimé, 2009). Emotional support, when provided helpfully and sensitively, can improve the subject's emotional state and help the sufferer to better cope with the situation (Stroebe & Stroebe, 1996). Following Rimé's (2009) argument that being the recipient of SSE triggers an emotional experience of similar emotional valence and intensity in the recipient, we posit that the intensity of online emotional support would vary in terms of the emotional valence of the initiator post. We propose:

*H2: The intensity of emotional support in feedback is stronger for negative initiator SSE posts than for positive and bivalent initiator SSE posts.*

**Affective feedback to negative and positive emotion: empathy.** We define empathy as the ability to imaginatively engage oneself in the subjective point of view or feeling of another person (Davis, 1983). The notion of empathy implies that the emotions of the recipient match with the other person's feelings. In other words, the recipient has the ability to identify with the other, adopting his or her perspective of the situation (De Waal, 2009).

Empirical studies on SSE have found that the targets of emotional sharing may often develop empathy towards the initiator (Rimé, 2009) and experience empathetic emotions in response to an initiator's SSE (cf., Shortt & Pennebaker, 1992). Since the main motivation behind empathy is to help those experiencing a distressing (thus negative) situation (Hogg & Vaughan, 1995), we propose:

*H3: The intensity of empathy in feedback is stronger for negative than for positive and bivalent posts.*

**Affective feedback to positive emotion: admiration.** Regarding SSE stemming from positive events, we propose that affective feedback would predominantly express admiration,

an emotion in response to appraisals of others' praiseworthiness (Ortony, Glore & Collins, 1988). Admiration is triggered in recipients in response to the initiators' sharing of emotions involving extraordinary displays of skill, talent or achievement (Algoe & Haidt, 2009). The expression of admiration would serve the goals of boosting the initiator's confidence and self-esteem and of reexperiencing the positive emotion.

Since the portrayal of positive emotion and/or achievement seems to be a common narrative in SNSs (e.g., John, 2013; Sas et al., 2009), we expect initiators to receive admiration as a rewarding and affirming gesture, in the case of positive SSE. We propose:

*H4: The intensity of admiration in feedback is stronger for positive initiator SSE posts than for negative and bivalent initiator SSE posts.*

## Method

### Materials: Live Journal Blog Posts

This study's single most important unit of analysis is the Live Journal blog post, which contains three sub-units. The first sub-unit is the initiator blog post, produced in Phase 1, where SSE initiation occurs. The second sub-unit of analysis consists of the *comments* to this initiation blog post, in which feedback is given to SSE in Phase 2. These comments are published by other Live Journal users and are visible in a comment thread, appearing right below the main entry. The third sub-unit of analysis is the *repost* by the initiator or original blog post author, phase 3 of the basic communication structure. Reposts by the initiator appear in the thread below comments from other users.

### Materials: Sample Generation

This study's research questions and hypotheses were evaluated in two different subsamples. For the first subsample, blog posts were randomly downloaded to gauge the prevalence of SSE in Live Journal. For the second subsample or affect sample, we developed a procedure to select blog posts with emotional content. In some analyses both subsamples were combined into the overall sample. For sample generation, a semi-automated quantitative content analysis of *blog posts* in Live Journal was conducted.

**Random sample generation.** An initial pool of blog posts (8.8 million) was randomly retrieved using a Python Beautiful Soup application. The downloading of blog profiles took approximately three weeks and was initiated at the end of October 2013. In order to avoid blogs containing very few words or just once sentence, only blog posts that fulfilled the following criteria were selected: a minimum length of 200 characters, belonging to one

personal blog profile (thus not belong to a (support) group), and having at least two comments. After retrieval, a language scan of the blog profiles using Python's "guess language" application was performed, after which the original sample was reduced to 7.701.284 blog posts (87.3% of the original sample). From these posts, a cryptographic function in the PostgreSQL database was used to generate the random sample for human coding ( $n = 270$ ).

**Affect sample generation.** Since initiator SSE may occur more often among those blog posts that express emotion than in a random sample, an affect sample was drawn from the initial pool. For this purpose, blog posts were scanned as to occurrence of affect words. Afterwards, we assessed the sentiment polarity for each word that matched with the Affect database words (Neviarouskaya, Prendinger, & Ishizuka, 2007). The Affect database contains 1627 words (adjectives, nouns, verbs and adverbs) supposed to trigger a more intense emotional reaction, such as "love," "hate," or "disaster," compared to more neutral words such as "book." Polarity scores refer to the affective valence of the word ranging from -5 (highly negative) to +5 (highly positive) and were assessed using the SentiStrength web service (Thelwall, Buckley, Paltoglou, Cai, & Kappas, 2010). Once the affect words of each post were identified, the absolute value of the polarity of all affect words (given by SentiStrength) was summed up and divided by the total number of affect words in the post, a procedure inspired by the SentiRank algorithm (Feng, Wang, Yu, Yang, & Yang, 2009). Subsequently, an affect blog posts sample was created with the blog posts that ranked the highest in sentiment polarity for human coding ( $n = 270$ ).

**Coding scheme and procedure.** A coding scheme based on Rimé's description of SSE and its processes (Christophe & Rimé, 1997; Rimé et al., 1991, 1998; Rimé, 2009) was developed. Emotional support, empathy and gratitude items were adapted from the literature (Algoe & Haidt, 2009; Watkins, Woodward, Stone, & Kolts, 2003). Coding took place using custom software specially designed for this research, accessible to coders via Internet. Codebook items were pretested until satisfactory convergence was reached by the principal investigator and two independent coders, who worked individually. An initial test after the first round of coding of 50 blog post entries was satisfactory, for instance the variable indicating the presence of SSE in blog posts reached a high reliability (Cohen's Kappa: .88,  $p < .001$ ). Halfway through the coding procedure, a new inter-trainee reliability test was carried out indicating that this agreement was consistent over time (Cohen's Kappa: .96,  $p < .001$ ). The full codebook can be obtained upon request from the first author. The measures based on the codings is next presented.

## Coding Measures

### First SSE Phase Measures

**SSE initiator post.** Whether SSE occurred in the initiation post was assessed on the basis of the following question: “Does the initiator post contain SSE?.” Answer categories: “yes” and “no” (Cohen’s Kappa = .84,  $p < .001$ ). The no answers were classified as non-SSE posts.

**Full initiator SSE post.** Full SSE initiation was assessed by the following question: “Does a full initiator post occur in the post?” Answer categories “yes” and “no” (Cohen’s Kappa = .73,  $p < .001$ ).

**Partial SSE feelings post.** A SSE feelings post was assessed with the following question: “Does the SSE post only describe the feelings of the initiator, but no situation or cause to explain these feelings?” Answer categories: “yes” and “no” (Cohen’s Kappa = .78,  $p < .001$ ).

**Partial SSE situation post.** A SSE situation post was assessed with the following question: “Does the SSE post only describe an emotional situation, and are the feelings of the initiator regarding that particular situation not explicitly described?” Answer categories “yes” and “no” (Cohen’s Kappa = .73,  $p < .001$ ).

**Initiator SSE post valence.** The valence of the SSE post was assessed with the following question: “Is the SSE in the post positive or negative?” Answer categories included “positive,” “negative,” and “negative and positive” (Cohen’s Kappa = .79,  $p < .001$ ). The latter is the operationalisation of bivalent posts.

**Initiator post topic.** The topic of the SSE post was operationalized with two different questions. The first question was: “Is the SSE post mostly about a positive important life event for the initiator?” Answer categories included: “no,” “getting a relationship or marrying,” “birth of new family member,” “birthday” (of initiator or second person), “getting a promotion,” “winning something” (i.e., a prize, a raise). The second question was: “Is the SSE post mostly about a negative life event for the initiator?” Answer categories included: “no,” “relationship break up,” “separation or divorce,” “death of a family member or close friend,” “death of a relative,” “personal illness or injury,” “illness or injury of family member/close friend.” For both questions, coders could use a blank entry box to add categories that were not included in the list.

## Second SSE phase measures

**Feedback.** The presence of affective and cognitive feedback was operationalized with two similar questions: “Is affective (respectively, cognitive) feedback present in the response post(s)?” Categories included “yes” and “no” (Cohen’s Kappa = .82 for affective, and .79 for cognitive, both  $p < .001$ ).

**Empathy intensity.** The intensity of empathy was assessed with the question: “In general, how strong is the empathy present in feedback?.” Categories included “None,” “very weak empathy,” “weak empathy,” “moderate empathy,” “strong empathy,” and “very strong empathy” (Cohen’s Kappa = .73,  $p < .001$ ).

**Emotional support intensity.** The presence of emotional support was assessed with the question: “In general, how strong is the emotional support present in feedback?.” Categories included “None,” “very weak emotional support,” “weak emotional support,” “moderate emotional support,” “strong emotional support” and “very strong emotional support.” (Cohen’s Kappa = .72,  $p < .001$ ).

**Admiration intensity.** The presence of admiration was assessed with the question: “In general, how strong is the admiration present in feedback?.” Categories included “none,” “very weak admiration,” “weak admiration,” “moderate admiration,” “strong emotional admiration,” and “very strong admiration.” (Cohen’s Kappa = .71,  $p < .001$ ).

## Results

### Research Questions

Our first research question referred to the extent that the different types of SSE posts occurred in Live Journal. We considered posts that expressed emotion in the overall sample of blog posts ( $n = 540$ ). Posts containing a form of emotional expression represented 57.4% of the sample, while non-emotional posts accounted for 42.6%. Therefore, it can be concluded that emotional blog posts were prevalent in the overall sample. Of all emotional posts ( $n = 309$ ), full initiator SSE posts were predominant (73.5%), while the representation of partial feelings SSE posts and partial situation SSE posts was minimal (19.1% and 7.4% respectively). Thus it seems that when expressing emotions in Live Journal, users preferred to communicate full accounts of events (the emotional situation plus the feelings regarding this situation), instead of telling only causes and circumstances or only venting feelings. A detailed description of types of blog posts appearing in the different samples can be consulted in Table 1.

Our second research question concerned the extent to which positive, negative and bivalent emotional posts occurred in Live Journal. In the emotional posts or SSE posts sample ( $n = 309$ ), we found that negative posts were predominant (53.1%) ,while positive posts accounted for 22.3%. The difference between negative and positive posts was significant ( $\chi^2(1)$  ( $n = 309$ ): 100.478,  $p < .001$ ). As to bivalent posts, these accounted for 24.6% of the sample, shortly outnumbering positive posts. The difference between bivalent and positive posts was significant ( $\chi^2(1)$  ( $n = 309$ ): 28.977,  $p < .001$ )

Table 1. Frequencies of main SSE initiation and feedback variables

	Overall sample (n = 540)		Affect sample (n = 270)		Random sample (n = 270)	
	Percentage	Chi-Square	Percentage	Chi-Square	Percentage	Chi-Square
Full SSE post	42.2% (228)	13.067*	58.1% (157)	7.170*	26.3% (71)	60.681*
Partial Situation SSE post	4.3% (23)	451.919*	1.1% (3)	258.133*	7.4% (20)	195.926*
Partial Feelings SSE post	10.9% (59)	329.785*	19.3% (52)	102.059*	2.6% (7)	242.746*
SSE posts	57.4% (310)	10.141*	78.5% (212)	87.837*	36.3% (98)	20.281*
Non-SSE posts	43% (230)	11.852*	21.5% (58)	87.837*	63.7% (172)	20.281*
Positive SSE posts	12.8% (69)	132.548**	11.9% (32)	75.748**	13.7% (37)	217.378**
Negative SSE posts	30.4% (164)	132.548**	47% (120)	75.748**	13.7% (37)	217.378**
Bivalent SSE posts	14.1% (76)	132.548**	19.3% (52)	75.748**	8.9% (24)	217.378**

SSE in online social networks

Affective feedback	33.7% (182)	57.363*	49.6% (134)	.015,	17.8% (48)	112.133*
Cognitive feedback	20.9% (113)	182.585*	30.7% (83)	40.059*	11.1% (30)	163.333*

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\* $p < .001$ ,  $df = 1$ , \*\* $p < .001$ ,  $df = 3$

Our third research question concerned the extent to which positive and negative life events were present as topics of SSE. In the overall sample, only 10% of blog posts depicted positive life events, such as entering a new relationship or getting married (2.3%) or celebrating a birthday (1.6%). Other positive topics that emerged from the coding process (entered by coders on a blank entry cell) included passing a driving test and being able to quit drugs. Negative life events represented 12.3% of the overall sample. Among the most mentioned categories were relationship break ups or divorce (5.2%) and the death of a family member or close friend (1.6%). Other topics that emerged from the coding process itself were being the victim of a robbery and the death of a pet. In sum, we found that major life events were present to a limited extent and that most SSE initiations concerned more “mundane” topics.

### Hypothesis Testing

Hypothesis 1 stated that affective feedback would predominate, compared to cognitive feedback. In the overall sample ( $n = 540$ ), affective feedback was found to be prevalent (33.7%) over cognitive feedback (20.9%). The difference between affective and cognitive feedback was significant ( $\chi^2(1) (n = 540): 51.016, p < .001$ ). We note that when comparing the two samples (random and affect sample), the difference between affective and cognitive feedback became more extreme in the affect sample (49.6% and 30.7% respectively), but was non-significant in the random sample (17.8% and 11.1% respectively) (see Table 1). A warning is in place here because different test outcomes for the two samples may be due to non-equal sample size, to which Chi-Square is particularly sensitive (Kline, 2011). We thus find partial support for hypothesis 1.

Hypothesis 2 proposed that the intensity of emotional support in feedback would be stronger for negative initiator SSE posts than for positive or bivalent posts. To test this and the subsequent hypotheses, negative, positive and bivalent posts were dummy coded and subjected to contrast tests. There was a significant effect of emotional valence on emotional support  $F(2, 185) = 8.89, p < .001$ . Planned contrasts revealed that the mean difference for the negative emotional valence was significant compared to the mean of positive and bivalent posts together ( $M = .65, SE = .148, t(185) = 4.395, p < .001$ ). In other words, feedback providers gave greater emotional support in cases of negative initiator posts, than for positive or bivalent posts. We find support for hypothesis 2.

Hypothesis 3 predicted that the intensity of empathy in feedback would be stronger for negative posts than for positive or bivalent posts. Emotional valence had a significant effect on empathy  $F(2, 185) = 11.82, p < .001$ . Planned contrasts showed the mean difference for the negative emotional valence significant compared to the mean for positive and bivalent

posts together ( $M = .83$ ,  $SE = .171$ ,  $t(185) = 4.869$ ,  $p < .001$ ). This means that feedback was more intense empathy in response to negative than to positive or bivalent posts, supporting hypothesis 3. Descriptive statistics for main intensity variables can be found in Table 2.

Hypothesis 4 stated that the intensity of admiration in feedback would be stronger for positive initiator SSE posts than for negative initiator SSE posts. There was a significant effect of emotional valence on admiration  $F(2, 185) = 7.89$ ,  $p < .01$ . Planned contrasts revealed that the mean difference for the positive emotional valence was significant compared to the mean of negative and bivalent posts together ( $M = .79$ ,  $SE = .243$ ,  $t(185) = 3.268$ ,  $p < .001$ ). This means that feedback was more intense in admiration in the case of positive than negative or bivalent posts. We find support for hypothesis 4.

When considering the two different subsamples (random and affect), we observe that predicted differences tend to be more extreme in the affect sample, for instance the proportion of SSE blog posts versus non SSE blog posts and the degree of emotional valence of the posts (see Table 1).

Table 2. One Sample T-test Values for Main Intensity Variables (all  $p < .001$  except when indicated)

	Overall sample ( $n = 540$ )		Affect sample ( $n = 270$ )		Random sample ( $n = 270$ )	
	M (SD)	t-test	M (SD)	t-test	M (SD)	t-test
Emotional support	.21 (.7)	$t(308) = 6.82$	.33 (.85)	$t(308) = 6.35$	.08 (.47)	$t(308) = 2.83^*$
Empathy intensity	.32 (.84)	$t(308) = 8.72$	.49 (.97)	$t(308) = 8.28$	.14 (.65)	$t(308) = 3.62$
Admiration intensity	.67 (1.2)	$t(308) = 12.97$	.96 (1.4)	$t(308) = 10.69$	.38 (.99)	$t(308) = 6.28$

$p < .01$ .

## Discussion

Given the ubiquity of emotion in SNSs communication, it is surprising that very few studies have dealt with the identification of the type and processes behind SSE in SNSs. Based on SSE theory, this study attempted to fill this gap in the literature by presenting a three-phased basic model to conceive online SSE, constructing a code scheme inspired on the main SSE components, and assessing the occurrence of SSE in a popular blog SNSs, Live Journal.

Our study detected a significant and predominant presence of posts displaying SSE in Live Journal. About half of all blog posts displayed a form of SSE. This is a remarkable finding, since even though there are many different types of blog usage (e.g., for general interest, hobby, fandom), Live Journal users had a preference to share their everyday feelings and experiences. More precisely, the category of full or complete SSE was predominant, as opposed to the mere 'venting' of feelings, or mere reference to situations that might somehow be emotional. Therefore, when sharing an emotional experience, users were more prone to describe the full emotional event, accompanied by explicitly mentioning their feelings. This finding and the subsequent feedback findings strengthen the argument towards a more pro-social form of emotional exchanges in SNSs, as opposed to just 'venting' emotions.

Interestingly, in the affect subsample, the proportion of SSE blog posts reached 77.8% against 22.3% of non-SSE posts. This finding is relevant, because the presence of affect words could objectively signal any type of content (e.g., songs, poems or fan blogs). However, the site was used in approximately a 3/5 ratio for emotional expressions involving SSE. This finding again undermines the all too stereotypical view of SNSs as platforms for the superficial venting of emotion. The content analysis of emotional posts reveals that in large part, emotions are not vented but shared in SNSs, that is, they are told to enable or invite recipients to understand these emotions and to provide feedback.

Regarding valence, this study found that negative posts were predominant, followed by bivalent posts and lastly positive posts. A possible explanation for this finding is the common conception of blogs as "an online personal diary," in which users can write their uttermost feelings and experiences and release their emotional tension (Nardi et al., 2004), which makes blog posts prone to the sharing of more negative than positive emotion.

Interestingly, bivalent posts occurred more commonly than positive posts. It seems fair to consider that bivalence may be an expression of the complex emotional environment that individuals live in. This finding implies that the sharing of mixed emotion and its feedback may be important to consider when researching online expression of emotion and its effects in SNSs community. Our study is the first to consider bivalence in the context of online SSE expressions.

Regarding the topic of SSE, this study surprisingly found little evidence to support the claim that the topics of SSE would be about important life events, as posed by SSE theory's initial focus on the SSE of emotional traumas (Rimé et al., 1992). One explanation for this noteworthy finding may be that SSE initiators seemed to be of a fairly young age, judging by the topics of their postings. It is reasonable to assume that the majority of these individuals have not yet acquired the necessary life experience for the occurrence of decisive life events. Furthermore, the rather frequent posting leaves ample space to post everyday hassles in the site. An implication is that the sharing of emotion in SNSs communication, even though not "superficial" as the mere venting of emotions, could take "light" forms of SSE, in the sharing of everyday nuisances or positive happenings. Online SSE may be mildly beneficial on a regular day-to-day basis, with initiators finding relief in sharing minor vicissitudes of life and receiving support from the SNSs community.

Our study has been the first to account for differences in the provision of affective or cognitive feedback as a response to online SSE. In line with our hypothesis, affective feedback was found to predominate, compared to cognitive feedback in the overall sample. This finding confirms SSE theory about recipients being keener to provide this kind of feedback. In order to observe nuance, we must note that both affective and cognitive feedback were not very prevalent, reaching percentages of around 30% in the overall sample. This finding may imply that akin to FtF communication, the ideal conditions for appropriate feedback to SSE are rare and require proper occasions and resources, such as degree of attention and acquaintance between initiator and recipient. This finding awaits further comparative studies counting SSE frequency in both on and offline communication.

Regarding emotional support, its intensity was stronger for negative posts than for positive or bivalent posts, supporting our hypothesis. Therefore, the negativity of initiator SSE posts was positively related to the intensity of the given emotional support. This may mean that some receptors of online SSE are "attuned" to the emotional state of the initiator, and attempt to improve the emotional status of the writer, just like in FtF communication.

Interestingly, we found that emotional support was also significantly provided in the case of positive posts. This finding coincides with the conceptualization of emotional support as making the initiator feel esteemed and appreciated. Consequently, feedback posts in response to positive emotion sharing can be considered as providing emotional support. As to empathy, its intensity was stronger for negative than for positive or bivalent posts. This means that when confronted with displays of negative SSE, Live Journal users generally showed empathy towards the initiator. This may be in an effort to ease their pain and let them know that others relate to their emotional experience. This finding confirms SSE theory: the recipient provides

feedback in an attempt to ease the suffering. Additionally, empathy was also significantly shown in the case of positive emotions, meaning it can also be expressed as a way to celebrate or be “happy with” and for the initiator.

Unsurprisingly, admiration was much stronger for positive posts than for negative and bivalent posts. This finding confirmed our expectations of feedback showing admiration for an achieved goal or success of the initiator. Subsequent studies may focus on whether positive posts and the subsequent admiration in feedback may trigger a ‘positive spiral’ in the comment thread, not only enabling the initiator to capitalise on their success, but also allowing the community to jointly lift its spirits.

### **Limitations**

One relevant limitation is that using content analysis did not seem an adequate method to investigate users’ emotional recovery from feedback. Though this measure was included in the analysis, it manifested itself in too little cases. One explanation is that there could be innumerable reasons why users would not specifically report feeling better in their repost, e.g. feeling that it is unnecessary to report it, or becoming occupied with other activities. Further research using another method to get a better glimpse of self-report measures, e.g., a survey study, is recommended. Another shortcoming is the decreasing popularity of Live Journal, affecting the generalizability of the results. This study could be replicated in a more popular SNSs (e.g., Facebook).

### **Conclusion**

This research has found evidence that online SSE occurs with considerable frequency in Live Journal and that the feedback provided conforms to beneficial requirements. This finding provides empirical grounds to a more profound and pro-social form of emotional exchanges in SNSs communication, as opposed to more superficial displays of emotion. Our findings pave the way for future research focused on the processes of online SSE, and on how online SSE can contribute to individuals’ overall well-being and life satisfaction