

Productive Love: A New Proposal for Designing Affective Technology

Ramon Solves Pujol and Hiroyuki Umemuro

Tokyo Institute of Technology, 2-12-1-W9-67
O-Okayama, Meguro-ku, Tokyo 152-8552 Japan
solves.r.aa@m.titech.ac.jp, umemuro.h.aa@m.titech.ac.jp

Abstract. Love highly present in peoples talks and all cultural spheres, its importance suggests the need to understand what role technology plays in relation to it and the roles it could play in the future. We review studies related to love in HCI and we identify a lack of consideration of philosophy as a background for love understanding. Based on literature review, we offer a proposal of guidelines for designing technology that aims to improve loving relationships. Besides, we examine principles of engagement with technology that may be important when designing love-promoting technology. Finally we present a Productive Love promoting system, which evaluation indicated that the participant found it useful to improve their Productive Love.

Keywords: Productive Love, affective technology, care, respect, responsibility, knowledge, lovers, family.

1 Introduction

In relationship to love and in the field of HCI there have widely been realized studies about transmission of personal information, intimacy, connectedness, awareness, and social presence. However, the understanding of love has not been approached specifically. What's more, what has been done is mainly based on people experiences and opinions. On the other hand, a philosophical approach may represent a further understanding of the experience of love, consequently, in this paper; our goal is to explore how technology can contribute to improve love relationships through basing our principles on philosophy.

Our contribution is the description of the existing and potential design space for HCI in relation to the field of love. We want to highlight the possibility of a new line of research that has for the most part been unobserved within HCI to date. That is the possibility of using philosophy and technology to improve love relationships.

The structure of this paper is as follows: We will introduce Productive Love philosophical approach and we will explain its possible applicability to HCI by offering a set of guidelines for Productive Love promoting technologies. We will briefly point examples of previous works related to love on HCI reflecting on the type of interaction that they may address under the basis of Productive Love. And we will indicate which areas seem to have room for improvement. Furthermore, we will explore principles of

engagement with technology, which may be important when designing love-promoting technology. Finally, we describe a Productive Love promoting application that embraces several of the proposed guidelines and we describe its evaluation. This application example aims to arise criticism and challenge future designs of love promoting technologies.

2 Productive Love from Theoretical Review

It seems that most people share the tendency to regard love as innate, passive, and basically the same as falling in love. Similarly, Burston explains that Plato, Schopenhauer, Nietzsche, Freud, and, Lacan represents the common understanding that erotic love is an involuntary passion, where love is "blind" and therefore, the adversary of reason. On the other hand, Burston points that Soren Kierkegaard, Max Scheler, Martin Buber and Erich Fromm represents the belief that genuine love always includes an element of volition [3]. Specifically, Fromm differentiated two kinds of love. (a) Immature love or symbiotic union, which corresponds to the person whose character, has not developed further than the receptive orientation, and we define as *Receptive Love*. (b) Mature love, attributable to the person who has developed productive character or orientation, is the representative of active love, and we define as *Productive Love* [9]. The idea of Productive Love has been approached by several philosophers under different designations such as being love by Abraham Maslow or benevolent love, altruistic love and agape love by Bernard Murstein [13]. As a validation of Productive Love-related theories that regard it as a higher form of love, agape love was positively correlated with relationship satisfaction [15].

Erich Fromm in his book "The art of loving", suggested that love is an art, therefore it could be learned as an art is. Moreover, Fromm proposed four basic elements common in all forms of for love: care, responsibility, respect and knowledge [9]. These appeal to us as basis for designing technology to improve love. Nevertheless, in addition to Erich Fromm's approach, we base the present survey and proposed guidelines on our extensive review of the works of several western theorists and researchers. Still, the theories and researches taken into account understand of love not as an involuntary passion but as a voluntary action, which can be improved. The reason that brought us to choose this approach is that the understanding of love as an action brings up the possibility to make use of the existent or future technologies to help to improve it.

We enumerate five key aspects in understanding of Productive Love. First, we summarize what has been described to be in relation to it. Second, we contrast with what has been described in relation to Receptive Love, its antagonist. Third, we include elements of theories and empirical studies about love in general terms that seem to be in accordance with Productive Love. Finally, as a representative of the differences between people's beliefs about love nowadays and our Productive Love approach, we include a comparison between Fromm's understanding of care, respect, responsibility and knowledge and the results of a brainstorming regarding to them carried out with five participants [9].

2.1 Elements of Productive Love

A synthesis of the elements related to the concept of Productive Love is the following: self preservation, striving for the other, giving, concern for the other, appreciation of love, enjoy the other, selflessness, non exchange, realism, maturity, and insight [9, 10, 13, 19].

2.2 Elements of Receptive Love

A synthesis of the elements related to the concept of Receptive Love is the following: objectification, complementarily, fairness, exchange, ego, receiving, involuntary love, evaluation, materialism, and irrationality [9,13].

2.3 Elements Related to Productive Love from Psychological and Philosophical Theoretical Studies

A synthesis of the elements related to the concept of Productive Love is the following: concern, communication, action, and independence [5, 8, 11, 18, 22].

2.4 Elements Related to Productive Love from Psychological Studies

A synthesis of the elements related to the concept of Productive Love is the following: concern, communication, striving for the other, and giving [14, 18, 20].

2.5 Discrepancies between Fromm's (1956) Theory about Love and Nowadays People's Thoughts from an Exploratory Brainstorming

First, Fromm defined care as active concern for life and the growth of that which we love [9]. However, participants mainly concerned about care between equals, and not much about care as labor for the other. Second, Fromm explained responsibility as a voluntary act, to be able and ready to respond [9]. Conversely, participants understood it mostly as a duty. Third, Fromm explained respect to be the ability to be aware of the other's person unique individuality [9]. In spite of this, participants concerned about too much respect, as negative. Finally, Fromm explained that knowledge is a core factor for love [9]. However, participants did not reflect on objectiveness as fundamental factor for the knowing about the partner.

3 New Directions: Improvement of Actual interactions

In order to obtain a summary representative of Productive Love, the above-introduced elements from literature were analyzed and classified. In addition, insights from the brainstorming were taken into account, resulting in the following list of elements of Productive Love.

- Preservation of personal individuality and freedom, not feeling of duty.
- Respect, not objectification or exploitation.
- Self-growth, not dependency on others.
- Care, responsibility and active concern, not involuntary love.

- Giving, not exchange and fairness.
- Selflessness, not egoism.
- Enjoy the other, as he is, not evaluation of the other.
- Enjoyment of the love experience, not materialism.
- Realism, not delusion.
- Knowledge, not lack of understanding.

4 Guidelines for Designing Technology That Promotes Productive Love

The objective of the Productive Love promoting technology is to create an environment where the users can experience the aspects related to Productive love. In that way, the users may be able to appreciate Productive Love qualities and perhaps help them find their own meaning about their loving relationships without the need of going through the theoretical aspects of the Productive Love theories, which could be discouraging.

This section introduces an initial proposal of theory and some examples of how the final elements of Productive Love could be taken into account when designing love-promoting technology.

4.1 Preservation of Personal Individuality and Freedom, Not Feeling of Duty

When using a love-promoting technology, there should be freedom of actions; there should not be rules of “good” or “bad”. There should neither be obligation for stereotyped actions such as using emoticons, which may not represent the user. On the other hand, love-promoting technology should facilitate every person to feel easy to express freely, such as accepting an open-ended range of actions instead of offering a pre-defined and limited one.

4.2 Respect, Not Objectification or Exploitation

Love-promoting technology should respect everyone’s desired degree of privacy such as not encouraging the use of devices (i.e., cameras) if this invades one’s privacy or lead control over a person. Moreover, love-promoting technology should not help in acquiring a person, or obtaining something from the other, as it could be obtaining personal favors or getting chores done.

4.3 Self-growth, Not Dependency on Others

Love-promoting technology should not lead to dependency. For instance, a device that facilitates a person to wake the other person in the morning would be better if it also facilitates the receiver in learning to do it by himself. A love-promoting device that intends to improve self-growth could facilitate to show the person’s improvements, which may help to improve self-awareness.

4.4 Care and Responsibility Not Involuntary Love

A love-promoting technology that intends to improve active concern for the other person and responsiveness for the other's actions could inform about the person illusions, dislikes, or moods, which could motivate responsiveness to the other's needs. For example, thinking how to do something for the other person when seeing that he or she needs it.

4.5 Giving, Not Exchange and Fairness

The actions done on love-promoting technology should facilitate to understand the other's pace instead of focus on a return, which may be derived from an operating logic that requires correspondence of actions. The user should be able to find pleasure on doing actions for the other. For instance, providing information of the other person's when receiving an action could motivate this.

4.6 Selflessness, Not Egoism

In a love promoting technology the source of pleasure should not remain in the human-device interaction but grow to be in the human-human interaction, which may lead to learn to enjoy doing actions for the other. In order to accomplish that, the actions carried out in the love-promoting technology should be far from fiction, as the ones carried out by fictional characters in fictional contexts in most of the video-games, but closer to real actions and real persons as accurately as possible.

4.7 Enjoy the Other, as He Is, Not Evaluation of the Other

Love-promoting technology should not make differences of rank, status, personal scoring, comparisons, or competition. For instance, high amount of actions should not be evaluated as better. Likewise, actions such as "buying a present" or "asking how are you" should not be established as having different value. Both of them should be shown as valuable in order to let the receiver understand its context and enjoy them.

4.8 Enjoyment of the Love Experience, Not Materialism

Love-promoting technology should not put a premium on the user actions by obtaining points or evaluation, which may drive focus on the return. However, initially, something similar to a game might provide initial interest, which could help to appreciate the love experience.

4.9 Realism, Not Delusion

Love-promoting technology should avoid showing an unreal or partial image of the partner, which may lead to create a wrong image of him or her. Love-promoting technology should avoid promoting idealization of the partner by showing too many signs of affection such as exaggerating emoticons, for example. What is more, in order to help for an objective understanding of the partner; love-promoting technology should transmit realistic information about good and bad things.

4.10 Knowledge, Not Lack of Understanding

In order to make possible other aspects of Productive Love, knowledge should be promoted by the love-promoting technology. To know about the other person could be helped by facilitating the user to provide personal information such as answering questions, being motivated to talk, write about oneself, or to share personal images or objects. However, knowledge could be collected as well automatically, using for instance, sensory technology that may collect images, sound, movement, presence, etc. It is possible as well to use the collected data to estimate the person's activity, emotions or feelings.

5 Engagement with the Technology

Love-promoting technology besides being a vehicle for human-human interaction is still a piece of technology that requires human-technology interaction. This section discusses factors that seem critical to effectively engage with the love-promoting technology.

The quality of the experience and the importance of enjoyment related to human computer interactions has been discussed by Blythe and Hassenzähl who explained fun to be trivial, repetitive, spontaneous, frivol and spectacle-like. While pleasure was explained to be relevant, progressive, not necessarily spontaneous, somehow serious, aesthetics or art-like, requiring commitment to the basic principles and rules of the activity, sources are limited to three: opportunities for personal growth, memory attachment, and anticipation [1]. Accordingly, in order to make the experience pleasurable, the love-promoting technology could strive for the feelings that can be experienced when remembering a loved person, or when anticipating the other person acts. Moreover, the mirroring of own acts could stress the consciousness of the active engagement, which may lead to personal growth. For example, a game where one is able to discover and do things for a partner could be a way to motivate the user to initiate some of the above described keys of pleasure in relation to the other.

Nevertheless, besides being pleasurable, love-promoting technology might need to provide an extra attractiveness in order to compete with nowadays most popular daily leisure activities such as watching TV, browsing the Internet, or playing videogames. Among nowadays popular leisure activities, videogames and web activities have been extensively linked to flow, concept that was initially introduced by Csikszentmihalyi, who explained it as an optimal experience that follows the optimal combination of challenge and skill levels of the person and the situation [7]. In that sense, a game-oriented or web-oriented application could be at first appropriate for the love-promoting technology. For example, if icons suggest some kind of easy interaction, it might lead to reactive operation and thus, be attractive and fun.

6 Previous Related Works

Intimate awareness systems were explored through metaphoric representations, for instance, the *LumiTouch* picture frame lighted when the remote user touched another picture frame [4], and the Lover's cups transmitted the movement of a cup into

illumination [6]. However, metaphors fail to provide objective knowledge about the partner, which is needed as a basis for growing Productive Love. Some proposals transmitted the information in a more objective way, the *Whereabouts clock* demonstrated to serve as reassurance through an animated representation of family location where members of the household are represented by icons linked to the location of their cell phones [2]. However these devices are restricted on transmitting information of the person's inner situation, which is vital for promoting Productive Love. Some proposals transmitted even more personal information. For instance, in the *ToTell list*, pictures or messages acted as a post card, that functioned as a reminder of interesting moments and experiences to talk about [17]. However we believe that there is the possibility to provide intimate information automatically, which may not fail to be continuously provided and serve to instigate Productive Love growth.

In order to approach the above-mentioned designs related to love, several research methods have been used. Participatory designs were used to find out what people miss [12]. Furthermore, Vetere used cultural probes and listed several research methods: online questionnaires, data logs, longitudinal focus groups, interviews, and written reflections [21]. The pointed methods rely on people's opinions and habits about their relationships. However, we believe that generally, people may not understand love in such a deep way as philosophers do, therefore people's ways could be improved through the Productive Love principles.

7 System: Pictures' Call

This section provides a practical example of a system that embraces several of the proposed guidelines for love-promoting technology and factors of engagement with technology.

7.1 Description

The system automatically takes pictures of each of the users and sends to the other. The automatism frees the users from a task that could represent duty, a burden, and thus, could be abandoned. Essentially, the automatism intends to provide better engagement with the system, and consequently with the other person.

The pictures are taken through a tablet PC that displays a mirror image when functioning. Five pictures a day are taken in random intervals, this way the photographed person appears completely natural, doing whatever he is doing and away from posing and choosing the best smiling picture to be send. This ensures that the information realistically and objectively represents the person.

In order to respect intimacy, the system incorporates a reset button and the pictures are sent after a security delay of thirty minutes. This way, if necessary, the user is able to reset the system anytime before the pictures are sent, protecting his individuality and freedom.

The pictures are received in a second tablet PC, where the pictures are automatically displayed as a slideshow. Receiving updated pictures of the companion is useful for improving the knowledge about the other, and may motivate care and responsibility. Moreover, in order to promote active concern for the other person, as well as

engagement with the system, the pictures are directly commented by writing on them using the touch panel display, and re-sent to the original person. This encourages the person to take an action related to the person who appears in the picture, which can be considered as a gift and a selfless act. What is more, receiving commented pictures of oneself, which one has even not seen yet, serves as a mirror that supports personal awareness. This also keeps the user interested and engaged with the technology and therefore with the loved person, which helps to enjoy the love experience, and the other.

7.2 Evaluation

The system installed in two households, one of which were parents on their fifties, and the other was their son on his twenties. The participants used the system for one week and answered six questionnaires about Productive Love and the system use.

Before using the system, the participants answered a questionnaire about how much they valued the items of Productive Love. This questionnaire was returned after using the system and they answered a second questionnaire on how the system helped them to achieve Productive Love. Besides, the participants answered a Productive Love questionnaire about their relationship with the other household member. This questionnaire was administrated before and after using the system in order to detect if the participants experienced changes on their Productive Love relationships.

A fourth questionnaire assessed the costs and benefits of communication. A fifth questionnaire assessed three of the Nielsen's [16] five criteria of usability: learnability efficiency and satisfaction. Finally, a sixth questionnaire asked their impressions about the system.

The participants evaluated positively Productive Love items, indicating that were suitable for them. The most valued factor was *respect* and the less valued was *realism*. The participants felt that the system helped them to achieve Productive Love as well, particularly, the participant that rated the system as more helpful was the mother who spent more hours with the system. The factors that the device was ranked on being more helpful were *care and responsibility*, *selfless*, *enjoy the other* and *knowledge*, while the factor that was less ranked was *self-growth*. In the other side, the overall difference before and after using the system, about Productive Love between the distant familiars, still positive, was minimal, which seems attributable to having used the system for only one week, which may be not long enough to lead the action done for Productive Love be reflected on the users relationship.

The costs and benefits of communication questionnaire showed that the system was not well evaluated in terms of privacy. The reasons were where the mother's concern about spending long time in front of a camera, and the son's concern about the fact that a large part of his room was taken by the camera. Placing the camera in a less intrusive place might solve those problems. In the other side, the system was well evaluated in terms of not causing expectations or obligations. This makes the system valuable for relationships where one of the parties has higher desire of updated information than the other, for example, grandparents who may want to see more about the young generations, which are sometimes too busy to keep informing them.

The learnability and efficiency of the system were evaluated low, the reason seems to be that the system had technical problems, and stopped several times. For

instance, the system errors made the son worry about if his parents had received his comments or not. In the other side, the system was well evaluated in terms of satisfaction the witch indicates that in spite of its errors the participants were able to enjoy it. The father appreciated sending comments, but he would like as well, to send own-taken pictures through the system and use it for videoconference. The mother enjoyed seeing things in a natural setting that she even did not see when living together with her son. The son highly valued sending and receiving hand righting in real time, and being able to handwriting itself, which let him transmit his feelings.

8 Conclusion

A love-promoting technology might not love itself. However, providing enjoyment of doing activities related to the other person may help to know the other, thus may be able to create the conditions to improve Productive Love. Eventually, those activities might substitute general forms of entertainment such as watching TV, or playing videogames, which are done without relation with the loved persons. Our system evaluation indicated that the participants felt that it helped them to achieve Productive Love. However, further evaluations should be done during longer period in order to materialize those improvements in the users lives. Besides, future development of the system should address the experienced technical problems.

Acknowledgments. The authors would like to thank the anonymous voluntary participants for their contributions in the evaluation study.

References

1. Blythe, M., Hassenzahl, M.: The semantics of fun: Differentiating enjoyable experiences. In: Blythe, M.A., Monk, A.F., Overbeeke, K., Wright, P.C. (eds.) *Funology: From Usability to Enjoyment*, pp. 91–100. Kluwer, Dordrecht (2003)
2. Brown, B., Taylor, A.S., Izadi, S., Sellen, A., Kaye, J.J., Eardley, R.: Locating Family Values: A Field Trial of the Whereabouts Clock. In: Krumm, J., Abowd, G.D., Seneviratne, A., Strang, T. (eds.) *UbiComp 2007. LNCS*, vol. 4717, pp. 354–371. Springer, Heidelberg (2007)
3. Burston, D.: Reply to Pnina Shinebourne's Essay Review in *Existential Analysis* 17.2 on *The Art of Loving* by Erich Fromm. *Existential Analysis* 18(1), 198–201 (2007)
4. Chang, A., Resner, B., Koerner, B., Wang, X., Ishii, H.: LumiTouch: An emotional communication device. In: *Ext. Abstracts CHI 2001*, pp. 313–314. ACM Press, New York (2001)
5. Chapman, G.: *The Five Love Languages*. Northfield, IL, Chicago (1995)
6. Chung, H., Lee, C.H., Selker, T.: Lover's cups: drinking interfaces as new communication channels. In: *Ext. Abstracts CHI 2006*, ACM Press, New York (2006)
7. Csikszentmihalyi, M.: *Flow: The Psychology of Optimal Experience*. Harper Row, New York (1990)
8. Dion, K.K., Dion, K.L.: Cultural perspectives on romantic love. *Personal Relationships* 3, 5–17 (1996)
9. Fromm, E.: *The Art of Loving*, 1995th edn. Thorsons, London (1956)

10. Gelbond, B.: Self-actualization and unselfish love. *Journal of Religious Humanism* 13, 74–78 (1979)
11. Hatfield, E., Utne, M.K., Traupmann, J.: Equity theory and intimate relationships. In: Burgess, R.L., Huston, T.L. (eds.) *Social Exchange in Developing Relationships*, Academic Press, New York (1979)
12. van der Hoog, W., Keller, A.I., Stappers, P.J.: Gustbowl: Technology supporting affective communication through routine ritual interactions. In: *Ext. Abstracts CHI 2004*, pp. 24–29. ACM Press, New York (2004)
13. Le, T.N.: A measure of immature love. *Individual Differences Research*, 3(b) (2005)
14. Lee, J.A.: *The colors of Love: An exploration of the ways of loving*. New Press, Ontario (1973)
15. Lin, L., Huddleston-Casas, C.A.: Agape love in couple relationships. *J. Marriage and Family Review* 37(4), 29, 48 (2005)
16. Nielsen, J.: *Usability Engineering*. Morgan Kaufmann, San Francisco (1993)
17. Romero, N., Markopoulos, P., Baren, J., Ruyter, B., Ijsselstein, W., Farshchian, B.: Connecting the family with awareness systems. *Personal and Ubiquitous Computing* 11(4), 299–312 (2007)
18. Rubin, Z.: Measurement of romantic love. *Journal of Personality and Social Psychology* 16(b), 265–273 (1970)
19. Shinebourne, P.: Erich Fromm's *The art of loving*: 50 years on. *Existential Analysis: Journal of the Society for Existential Analysis* 17(b), 397–408 (2006)
20. Sternberg, R.B.: Construct validation of a triangular love scale. *European Journal of Psychology* 27, 313–335 (1997)
21. Vetere, F., Gibbs, M., Kjeldskov, J., Howard, S., Mueller, F., Pedell, S., et al.: Mediating intimacy: Designing technologies to support strong-tie relationships. In: *Proc. SIGCHI 2005*, pp. 471–480. ACM Press, New York (2005)
22. Weinstein, R.S.: What heals in psychoanalysis? *Psychoanalytic Inquiry* 27, 302–309 (2007)