Max Planck Research Group

Affect Across the Lifespan (Concluding Report)

Head: *Michaela Riediger*

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Introductory Overview

How do emotional experiences change from adolescence to old age? And how does the ability to understand and deal with affective experiences develop across the lifespan? These are questions that the Max Planck Research Group "Affect Across the Lifespan" investigated between 2009 and 2014. Unique features of the group's research approach involved the combination of a mobile-phone-based experience-sampling technology with psycho-physiological monitoring and controlled experimental paradigms, and the consideration that affective functioning takes place in, and is influenced by, the individual's social and ecological context. The group's work was characterized by two interrelated research emphases. A first emphasis on *affect dynamics* involved empirical investigations on age-related differences in the inner experiences, outward expressions, and physiological processes associated with affective experiences from adolescence to old age and on the mechanisms underlying these age-related differences, such as motivational and cognitive processes. A second research emphasis on *affective competencies* was characterized by empirical investigations on age-related differences in abilities related to understanding and managing emotional aspects of life.

Research Emphasis 1: Age-Related Differences in Affect Dynamics

Investigations of affect dynamics involved various studies, age groups, and methodological approaches. Core research activities from 2014, the final year of the group's work, are summarized below.

The Multi-Method Ambulatory Assessment (MMAA) Project

The MMAA project is an ongoing longitudinal research endeavor in cooperation with Max Planck Research Fellow Gert G. Wagner. It has been continued after conclusion of the Max Planck Research Group "Affect Across the Lifespan" in the Heisenberg Research Group (see pp. 251–256). To date, the MMAA assessments include five measurement waves in a total sample of about 600 participants ranging in age from adolescence to old age. The main goal of this project is to chart various aspects of affective functioning and their interrelations with motivational and cognitive processes over time as they naturally occur in the daily lives and natural environments of individuals from various age groups. To meet this aim, several ambulatory assessment methodologies, which allow measurements of experiences, cognitive capacity, and physiological processes in daily-life contexts, are combined with interview techniques and well-controlled experimental paradigms. Ambulatory assessment methods include mobile-phone-based experience sampling and ambulatory biomonitoring of cardiac activity (assessed via 24-hour electrocardiography), physical activity (assessed via 24-hour accelerometry), and hormonal processes (assessed via repeated ambulatory saliva samples).
A comprehensive summary of all research activities within the MMAA project since 2014 is beyond the scope of this report. They have addressed, for example, age differences in everyday affect-regulation motivation (e.g., Riediger & Luong, 2016), mental representations of affect valence (e.g., Riediger, Wrzus, & Wagner, 2014), and affective and physiological reactivity and recovery from stressful events (e.g., Wrzus, Müller, Wagner, Lindenberger, & Riediger, 2014). Other analyses investigated age differences in associations between affective and physiological arousal and working-memory capacity (e.g., Riediger et al., 2014) or in associations between sleep quality and emotional well-being (e.g., Wrzus, Wagner, & Riediger, 2014). Below, we exemplarily illustrate research within the MMAA project in 2014 with the example of a recent publication in the *Journal of Social and Personality Psychology.*

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Riediger, M., & **Luong, G.** (2016). Happy to be unhappy? Pro- and contra-hedonic motivations from adolescence to old age. In A. D. Ong & C. E. Löckenhoff (Eds.), *Emotion, aging, and health* (pp. 97–118). Washington, DC: American Psychological Association.

Riediger, M., Wrzus, C., & **Wagner, G. G.** (2014). Happiness is pleasant, or is it? Implicit representations of affect valence are associated with contrahedonic motivation and mixed affect in daily life. *Emotion, 14,* 950–961. doi:10.1037/a0037711

Wrzus, C., Müller, V., Wagner, G. G., Lindenberger, U., & **Riediger, M.** (2014). Affect dynamics across the lifespan: With age, heart rate reacts less strongly, but recovers more slowly from unpleasant emotional situations. *Psychology and Aging, 29,* 563–576. doi:10.1037/a0037451

Wrzus, C., Wagner, G. G., & **Riediger, M.** (2014). Feeling good when sleeping in? Day-to-day associations between sleep duration and affective well-being differ from youth to old age. *Emotion, 14,* 624–628. doi:10.1037/a0035349

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Wrzus, C., Wagner, G. G., & Riediger, M. (2016). Personality-situation transactions from adolescence to old age. *Journal of Personality and Social Psychology, 110,* 782–799. doi:10.1037/pspp0000054

Personality-Situation Transactions From Adolescence to Old Age

It has been argued that people choose and create their daily environments, and thus shape their own developmental contexts, according to their personality. Prior research shows, for example, that more extraverted people engage more often in social situations and more conscientious people engage more often in work-related activities, compared to less extraverted or less conscientious people, respectively. So far, the knowledge about such personality-situation transactions largely stems from studies with students and young adults. Our aim was to go beyond that and investigate whether personality-situation transactions differ between individuals from various age groups. Based on the assumption of an age-related increase in knowledge about oneself, we expected individuals to increasingly select everyday situations in accordance with their personality as they get older. To explore this idea, we used data from the first assessment wave of the MMAA project where 378 people aged 14 to 82 years described their Big Five traits and took part in a 3-weeks-long experience-sampling phase. Up to 6 times a day for 9 days, on average, participants reported their momentary activity and who else was currently present. Multilevel modeling results in fact showed associations between participants' personality and their everyday life contexts and some of these personality-situation associations indeed varied with the age of participants. For example, associations between being extraverted and spending more time with friends were only observed in adolescents and young adults, whereas associations between being open to new experiences and spending more time with friends were only observed in older adults (see Figure 1). Most personality-situation associations, however, were independent of age. These findings highlight that people's personality shapes the way in which individuals actively shape their own development through selecting everyday contexts. They also show that most of these personality-situation transactions may be largely similar across the lifespan, but that there are notable differences as well,

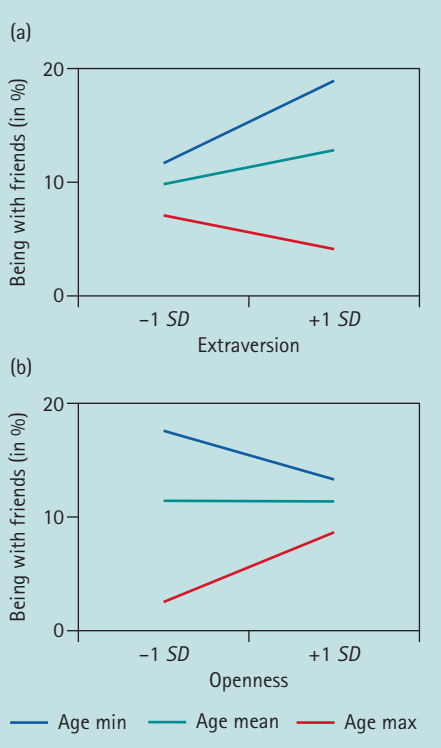

Figure 1. Personality and situation selection in everyday life. Associations between extraversion and time spent with friends were only observed in adolescents and young adults, whereas associations between openness for new experiences and time spent with friends were only observed in older adults (adapted from Wrzus et al., 2016).

which may be related to age-grade differences in the sociostructural constraints and affordances of everyday situations (Wrzus, Wagner, & Riediger, 2016).

Tune Yourself In: Valence and Arousal Preferences in Music-Listening Choices From Adolescence to Old Age

Previous findings from the MMAA project showed pronounced age differences in the affective states that people seek in their everyday lives. For example, although most people prefer positive over negative feelings most of the time and regardless of their age, adolescents are more likely than individuals from other age groups to occasionally also report contra-hedonic motivation (e.g., of wanting to maintain or enhance negative feelings; Riediger, Wrzus, & Wagner, 2014).

These findings have been replicated in various studies, which raised the question whether age-related differences in affect-regulation motivation are also reflected in people's regulatory behavior and their effectiveness.

To address this question, we conducted a series of three studies using music preferences as a means to study behavioral manifestations of affect-regulatory preferences. In Study 1, we developed an age-fair music-browsing paradigm. Individuals ranging in age from adolescence to old adulthood rated the valence and arousal levels of a large number of music pieces (i.e., how bright vs. dark and how calm vs. lively they perceived the music to be, respectively). From music pieces with age-invariant rating patterns, prototypical exemplars matching into four valence–arousal quadrants (positive–high arousal, positive–low arousal, negative–high arousal, and negative–low arousal) were selected. Age differences in musical taste and familiarity were accommodated through varying the musical styles and dates of origin within this music selection. In Studies 2 and 3, we used this age-fair music selection to examine age differences in behavioral manifestations of affect-regulatory preferences, as indicated by music-listening choices. We also investigated the effectiveness of music listening as an affect-regulatory strategy. To establish affectively relevant situations, we manipulated participants' momentary affective states (Study 2) and the salience of momentary interpersonal goals in an ostensibly upcoming discussion of a difference in opinion with a stranger (Study 3). The investigated samples included adolescents, young, middle-aged, and older adults.

In line with our hypotheses, we found age-related differences in preferences for music pieces varying in valence and arousal. In both studies, the older the participants were, the more they preferred positively valenced and low-arousing music (see Figure 2). Although the manipulations of affective states (Study 2) and interpersonal goals (Study 3) were successful, we found no effects of these experimental manipulations on music-listening choices. These findings extend previous research on age-related differences in affect-regulation motivation by implementing music selection as an everyday behavioral indicator of affect-regulatory preferences. Results of Studies 2 and 3 further show that listening to music, but not listening to affectively neutral sounds, yielded significant changes in participants' affective experiences. This suggests that music listening is indeed an effective means of affect regulation.

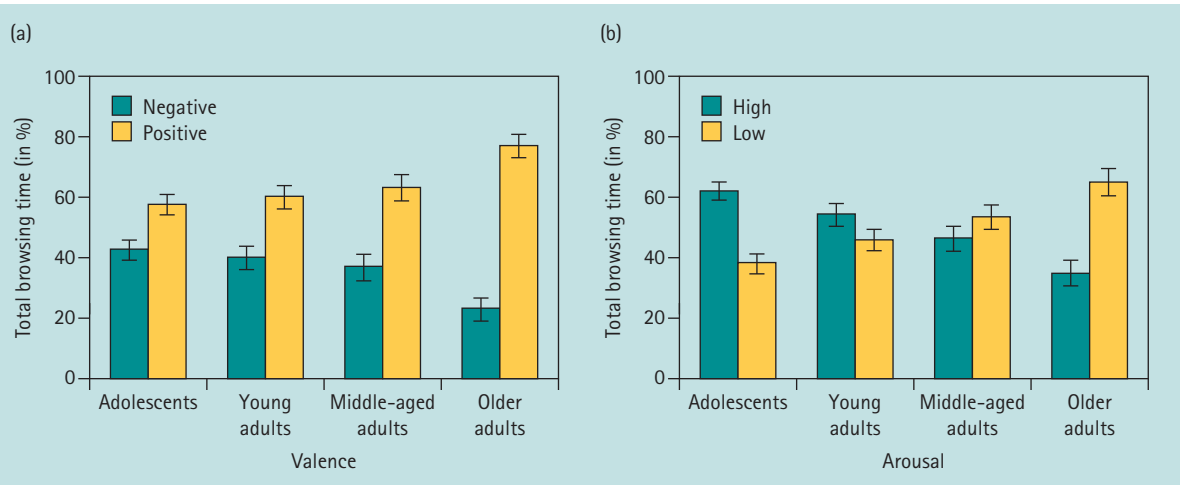

Figure 2. Age differences in music preferences (exemplarily illustrated with the example of data from Study 2). An age-fair music-browsing paradigm was developed to investigate age differences in music preferences. Participants freely browsed a preselected music collection for 10 minutes. Consistent with previous evidence on age differences in self-reported affect-regulatory preferences, we found an age-related increase in preferences for positively valenced and for low-arousing music.

Key Reference

Klipker, K., Wrzus, C., Rauers, A., & **Riediger, M.** (2017). Hedonic orientation moderates the association between cognitive control and affect reactivity to daily hassles in adolescent boys. *Emotion, 17,* 497–508. doi:10.1037/emo0000241

Adolescents' Reactivity to Daily Hassles: The Role of Hedonic Motivation and Cognitive Development

Compared to late childhood and adulthood, adolescence is a developmental period of enhanced affective instability and stronger affective reactivity to daily hassles. The reasons for this phenomenon are still under debate. Kathrin Klipker's dissertation project investigated the respective role of the interplay of cognitive, motivational, and hormonal factors in a longitudinal study with 148 adolescent boys (age 10 to 20 years).

One line of research within this project focused on the question why adolescents typically experience higher affective reactivity than children although they have comparatively more cognitive control—cognitive capacities that have been related to affect regulation and lower reactivity to daily hassles. Building on our earlier research, we assumed that motivational factors contribute to this apparent inconsistency. We expected that higher cognitive control in adolescents would only be associated with lower hassle reactivity if an individual is indeed motivated to increase or maintain positive affect. We measured cognitive control using a battery of working-memory tasks. Participants also took part in a mobile-phone-based experience-sampling phase across 2 weeks. At each measurement occasion (M = 46 reports) participants reported whether they had experienced any recent daily hassles. Additionally, they rated their momentary affective experiences and their current prohedonic motivation. Reactivity to daily hassles was measured as participants' negative affect following daily hassles, relative to their personal average negative affect.

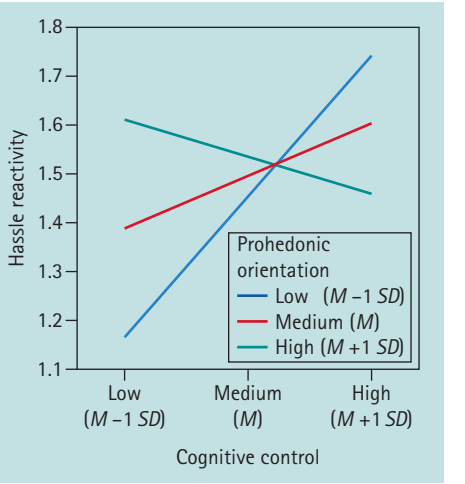

Figure 3. Associations between cognitive control and affective hassle reactivity in adolescent boys depend on their hedonic motivation. Participants' cognitive control was measured with a battery of working-memory tasks. Using mobile phones as assessment instruments, adolescents repeatedly reported whether they had experienced any recent daily hassles and rated their momentary affective experiences as well as their current hedonic motivation in daily life. Higher cognitive control was associated with lower hassle reactivity in adolescents with higher hedonic motivation. For individuals with low-hedonic motivation, higher cognitive control was related to stronger hassle reactivity (adapted from Klipker, Wrzus, Rauers, & Riediger, 2017).

In line with our predictions, higher cognitive control was not always associated with lower hassle reactivity. Instead, in individuals with low-hedonic motivation, higher cognitive control was related to stronger hassle reactivity (see Figure 3). These findings illustrate the value of taking into account the interplay of multiple domains, like motivational and cognitive factors, for understanding adolescent affectivity (Klipker, Wrzus, Rauers, & Riediger, 2017) .

Research Emphasis 2: Age-Related Differences in Affective Competencies

The second emphasis of our research was on age-related differences in abilities related to understanding and managing emotional aspects of life. In 2014, we focused much of our respective work on processes related to affect communication. One line of research addressed the role of cultural contexts for affect communication, another adressed age-related differences in, and social functions of, the ability to recognize other people's affective states.

German and Japanese Scripts for Anger and Shame Interactions

The goals romantic partners have for their relationships may affect the emotions they commonly experience during interactions as well as how they respond to each other. Together with Michael Boiger, a guest scientist from the University of Leuven, we tested this assumption by exploring German and Japanese scripts for anger and shame interactions in romantic relationships. Because anger is beneficial for the German goal of autonomy, we expected Germans to be more acquainted with anger interactions and have more elaborate interpersonal scripts for handling them than Japanese. For shame, which is more helpful for maintaining the Japanese goal of harmony, we expected the opposite pattern. Younger and older adults from Japan and Germany ($N = 382$) indicated for eight anger (or shame) situations, how frequent they are in their lives, how intensely they would respond to them with anger/shame, how their partners would react, and how angry/ashamed they would feel after the interaction. In each of the two cultures, participants perceived those interactions to be more frequent which helped them achieve relational goals (anger in Germany, shame in Japan). Further supporting our predictions, for interactions that elicited culturally beneficial emotions, the outcomes of the scripts depended more on the expected partner reactions than on the participants' initial feelings.

Adult Age Differences in Understanding Others' Affective States

Past research has suggested that the ability to recognize other people's emotions may decline throughout adulthood. This impression derived from laboratory research showing that older adults are typically less accurate than younger adults in labeling emotional stimuli like facial expressions. However, the stimuli used in conventional paradigms mostly involve posed and highly artificial expressions with limited ecological validity. With the aim to contribute to a more differentiated picture of age differences in the ability to understand others' feelings, we developed several new research paradigms with enhanced ecological validity.

No Smile Like the Other—Adult Age Differences in Reading Smiles

One approach toward enhancing ecological validity involved smiles instead of posed, supposedly prototypic expressions of intense basic emotions (Riediger, Studtmann, Westphal, Rauers, & Weber, 2014). Smiles are facial displays well suited for our purposes because they are subtle expressions of high ecological relevance that can be accompanied by different emotional experiences: People smile when they experience positive emotions, for example, when they are amused or happy. They also smile to conform to social conventions, for example, to be polite, even when not experiencing any particular emotions. People also occasionally smile while experiencing negative feelings, for example, during social conflicts when they want to appease their interaction partner.

We produced 80 video episodes of smiles that were either accompanied by positive affect, negative affect, or no emotions, as reported by the smiling targets. We then asked younger and older participants to identify the emotional experiences accompanying these smiles. In a first study, younger viewers (20–30 years of age) were more accurate than older viewers (70–80 years of age) at identifying emotional experiences accompanying smiles, reflecting a pattern observed in conventional laboratory studies. In a second study, age differences were attenuated when

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the smiling target was an older adult. While enhancing ecological validity, the smiles paradigm still employed isolated cues without context. Our further attempts toward enhancing ecological validity therefore pertained to investigating affective competencies in authentic interactions. This additionally allowed for investigating social implications of age differences in empathic accuracy.

Nice to Meet You—Social Implications of Empathic Accuracy Among Strangers

Empathic accuracy is assumed to facilitate social interactions and promote social adjustment. However, evidence on this notion is limited, particularly for older adults. To fill in this void, Elisabeth S. Blanke's dissertation project focused on the role of empathic accuracy between strangers for younger and older adults' social adjustment. We invited 208 younger (20–31 years of age) and older women (69–80 years of age) to our laboratory, paired them in unfamiliar dyads of varying age compositions, and videotaped the dyads as they engaged in a prestructured conversation about positive and negative events in their lives. Both partners then reported how satisfied they were with the conversation and with their social relationships in real life. After the conversation, participants watched the video and reported their own positive and negative thoughts and feelings at eight time points during the conversation and judged the partner's thoughts and feelings at the same time points. Empathic accuracy was determined by the agreement between the judgment and the self-report of the other partner.

Older women were less accurate than younger women in judging their interaction partners' negative thoughts or negative feelings, but there were no age differences in empathic accuracy for positive thoughts or positive feelings (see Figure 4). These differential age effects may point to the role of motivational factors for age differences in empathic accuracy.

In addition, both for younger and older adults, associations of empathic accuracy with social adjustment depended on the valence of the internal states. The more accurately participants inferred the positive thoughts and feelings of their interaction partner, the more they liked the conversation. Importantly, there were no such associations regarding the ability to infer negative thoughts and feelings (see Figure 4). Additionally, participants' accuracy for positive thoughts—but not for negative thoughts—was related to their satisfaction with their social relationships in daily life.

Taken together, age differences in empathic accuracy were confined to the inference of negative internal states, but this ability was unrelated to social satisfaction. In contrast, there were no age differences in empathic accuracy for positive internal states, but this ability was related to participants' social satisfaction in the laboratory and in real life. These findings might indicate that age differences in empathic accuracy for strangers pertain to skill facets that have only limited implications for social satisfaction.

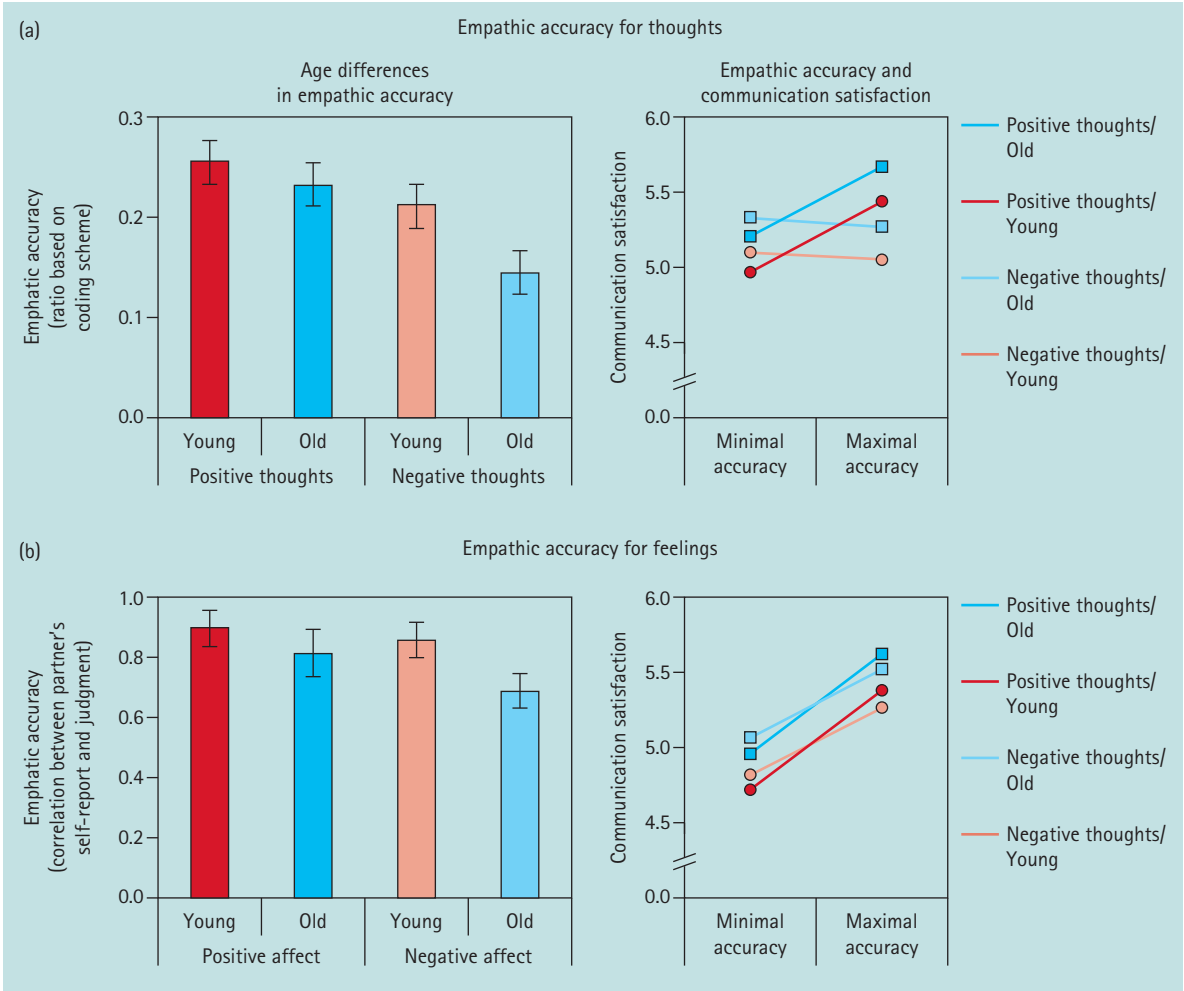

Figure 4. Age differences in empathic accuracy were only observed for negative (but not positive) internal states (left panels). Only empathic accuracy for positive (but not negative) internal states was related to social satisfaction (right panels; shown here: satisfaction with the conversation). Bars in the left panels show empathic accuracy (the ability to judge other people's internal states) separately for younger and older judges, and separately for positive and negative internal thoughts and feelings. The upper left panel represents empathic accuracy for thoughts, the lower left panel for feelings. Only for negative, but not for positive, thoughts and feelings were younger women more accurate than older women in judging their interaction partners' internal states. Participants additionally rated their satisfaction with the conversation in the laboratory and their satisfaction with their social relationships in daily life. The right panels show associations of empathic accuracy for thoughts (upper right panel) and feelings (lower right panel) with participants' satisfaction with the conversation. Empathic accuracy for positive (but not negative) thoughts and feelings was related to communication satisfaction.

Publications 2014–2016

(last update: Spring 2017)

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