Self and Identity

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Longitudinal directive effect of need satisfaction in self-defining memories on friend related identity processing styles and friend satisfaction

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ABSTRACT

Research suggests that identity and memory are deeply interconnected, but little is known about the identity processes and the memory characteristics involved in this interaction. We employed a longitudinal design to examine relations between the satisfaction of autonomy, relatedness, and competence needs in self-defining memories and identity processing styles within the domain of friendship. We also assessed satisfaction with friends to evaluate the relation of identity processes and memory characteristics to well-being in friendships. Participants were 166 students who responded twice (at about a two-year interval) to the Identity processing style Inventory-3 and the Satisfaction with Life Scale. We adapted these measures to tap into the domain of friendships, which is an important aspect of young adults' identity. Participants also described a friend-related self-defining memory and rated the degree of need satisfaction they experienced in that event. A cross-lagged panel analysis revealed that memory need satisfaction predicted increases in informational identity processing style and friend satisfaction over time. Implications for the directive function of memory in identity are discussed.

In a very basic sense, our past experiences are a central source of information for our identity (Conway, 2005). Accordingly, research showed that the content of our identity is related to our memories (McAdams & McLean, 2013). To have one's identity totally unrelated to one's memories would be considered delusional. This very basic link between memory and identity content suggests that memories could influence identity *processes*, an assertion that is still unexamined by research. Indeed, memories could orient the strategies individuals use to develop their identity. In parallel, the strategies used to build one's identity could affect the accessibility and salience of certain memories. In order to sort out these mutual influences, we will examine how identity processes and memory characteristics are related to each other over time.

Specifically, using a longitudinal design, we will assess the satisfaction of autonomy, relatedness, and competence needs in self-defining memories (Deci & Ryan, 2000; Philippe, Koestner, & Lekes, 2013) and individual differences in identity processing styles (Berzonsky,

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1992, 2011). Also, in accordance with research suggesting that identity is best understood as differentiated into domains rather than as a global overarching entity (Bouizegarene & Philippe, 2016; McConnell, 2010; McLean, Syed, Yoder, & Greenhoot, 2014), we will focus our analyses on a specific domain. We chose the domain of friendships because it is relatively universal (most people have friends), and because friendships are an important aspect of young adults' identity (Collins & van Dulmen, 2006), the present study's target population. In addition, since need satisfaction in memories and identity styles have each been associated with well-being (e.g., Berzonsky & Cieciuch, 2014; Philippe et al., 2013), we will examine their respective unique association with satisfaction with friends over time.

Identity and memory

Researchers who investigated the relation between identity and memory have had various perspectives. Some research assessed the influence of identity on memory. For instance, Howe (2011) provided evidence that the emergence of memories in infants depends on the development of a cognitive self (see also Nelson & Fivush, 2004). Cameron, Wilson, and Ross (2004) contend that memory for a past self depends on present self-evaluation. For Lampinen, Odegard, and Leding (2004), feelings that the self has changed modify the representation of past memories. Some research also examined the influence of memory on identity. From a narrative perspective, Singer and Blagov (2004) suggested that memories could function as momentary expressions of identity and can be recruited as a source of information to build identity through a process of narrative elaboration. Similarly, adopting a cognitive perspective, Wilson and Ross (2003) contend that memories influence identity in as much as they provide relevant information for its construction. While many claim that there is a bidirectional relationship between memory and identity (Klein, 2001; Conway, 2005; McAdams & McLean, 2013), so far those two constructs were measured at the same point in time. However, cross-sectional findings do not reveal if identity processes and memory affect each other and do not clarify whether this relationship is bidirectional or unidirectional. Accordingly, the main purpose of the present research is to examine the longitudinal relationships between memories and identity processes.

Identity processing styles

Berzonsky (1992) suggested that Identity Processing Styles (IPS) refer to individual differences in the strategies employed to integrate self-relevant information into one's identity. As such, IPS have more to do with the way people construct their identity (i.e., identity processes) than the content of their identity. Individuals with an *informational* IPS intentionally seek out self-relevant information (Berzonsky, 2011). They can commit to long-term goals that spawn from a genuine self-exploration process, and they can flexibly modify their self-image when their personal experiences provide evidence that it should. In contrast, individuals with a preference for a *normative* IPS approach self-relevant information with rigidity and close-mindedness (Berzonsky, 2011). Most of the time, they base their self-view on current social norms and internalized standards that their group and/or significant others suggest are the "right" ones. In addition, they always favor stability of self-views over revising them, regardless of disconfirming information. As we will focus on the friendship domain, we will refer to friend IPS as these individual differences in the processing of self-relevant *friend-specific* information.[1]

Self-defining memories

While identity and memory are connected, not all memories should be equally relevant for one's identity. Memories of mundane events like commuting to work or taking a shower are unlikely to be self-relevant, whereas memories of important events, like the first day at a new job or the death of a loved one, should be much more central to identity processes. Singer and Salovey (1993) called the latter type of memories *self-defining memories*. They defined them as memories that are vivid, emotionally intense, repetitively recalled, highly accessible, linked to a network of similar memories, and connected to unresolved conflicts or enduring concerns. Singer and Salovey (1993) postulated that self-defining memories greatly influence identity. Thus, self-defining memories should be especially informant with regards to understanding the respective influences of memory characteristics and identity processes.

Experiential component of memories

An important facet of self-defining memories is their experiential components: the experience-near sensory-perceptual traces of significant events that represent what the person experienced at the moment the event of the memory occurred (Conway, 2008). Philippe and his colleagues (Philippe, Koestner, Lecours, Beaulieu-Pelletier, & Bois, 2011; Philippe, Koestner, Beaulieu-Pelletier, Lecours, & Lekes, 2012; Philippe et al., 2013) provided evidence that, in accordance with self-determination theory (Deci & Ryan, 2000), remembered level of satisfaction of three fundamental psychological needs (autonomy, competence, and relatedness) is a basic experiential component of self-defining memories that directly contribute to several outcomes. For example, higher levels of need satisfaction in self-defining memories were associated with increased trait and situational well-being (Philippe et al., 2012; Philippe & Bernard-Desrosiers, in press) or more adaptive relational behavior over time (Guilbault & Philippe, 2017; Philippe et al., 2013). One mechanism proposed to explain the impact of need satisfaction in important episodic memories is that memories have a directive function that operates mostly outside of people's awareness (Pillemer, 2003). Self-defining memories are frequently activated in people's lives and therefore frequently direct people's attitudes and behaviors in the domain to which they are related (e.g., Philippe et al., 2013). Need satisfying self-defining memories typically promote openness and a willingness to seek accurate perceptions of experience and assimilate novel experiences into the self. Conversely, need thwarting memories signal a potential threat to the self and triggers self-defensive processes (Hodgins & Knee, 2002; Philippe et al., 2012). Over time, need satisfying self-defining memories should promote an informational identity processing style, which corresponds to openness to potentially self-relevant information and ease in changing one's existing identity. In contrast, need thwarting self-defining memories should facilitate a normative identity processing style over time, which corresponds to a closure to novel information and to elements that might threaten one's existing identity (Berzonsky, 2003).

Providing support to this reasoning, Bouizegarene and Philippe (2016) found that need satisfaction in friend self-defining memories was positively associated with friend informational IPS, but not with friend normative IPS. In addition, need satisfaction in friend memories and friend informational IPS were positively associated with friend satisfaction. However, that study being cross-sectional, they could not determine the direction of effects. Thus, two

potential conclusions remain. First, memories might have affected IPS such that need satisfaction in self-defining memories would have promoted openness towards self-relevant information, thereby leading to an informational IPS. Second, IPS might have affected memories such that individuals who process self-relevant information with openness and flexibility, as is characteristic of informational IPS, could have been more prone to regularly recall and attribute importance to past life events characterized by need satisfaction.

The present study

The purpose of the present study was to determine the direction of the effects between self-defining memories, IPS, and domain satisfaction by using a cross-lagged panel analysis. We asked the participants of Bouizegarene and Philippe's (2016) study to complete the same measures they did about two years earlier.

The present research should reveal how friend self-defining memories and friend IPS interact over time, and how they can lead to friend satisfaction. Importantly, these results could illuminate our understanding of the directionality of the relations between the remembered past and identity. Furthermore, this study should inform us on how identity processes and important memories can favor adaptive functioning over time, herein indexed by satisfaction. In accordance with past research (Bouizegarene & Philippe, 2016), we will test the bidirectional influences between memories and IPS and examine if (1) friend memory need satisfaction at Time 1 predicts increases in friend informational IPS over time and if (2) friend informational IPS at Time 1 predicts increases in friend memory need satisfaction over time. Furthermore, in line with findings respectively linking memory need satisfaction (Philippe et al., 2012) and informational IPS (Berzonsky, 2011) to domain satisfaction, we will examine if friend memory need satisfaction at Time 1 and friend informational IPS at Time 1 predict increases in friend satisfaction over time (the reverse associations will also be tested). Based on past research (Bouizegarene & Philippe, 2016), we do not expect that normative IPS will predict increases in memory need satisfaction or in friend satisfaction (or the reverse associations).

Method

Participants and procedure

A total of 165 undergraduate/graduate students (135 females, 30 males) from a Canadian university took part in this study and completed both time-point measurements over 20 months. According to Kline's (2011) recommendation of using approximately 5 cases per estimated parameter, this sample size can be considered adequate to estimate a path analysis of 36 parameters ($5 \times 36 = 180$). Participants' mean age was 27.23 years (SD = 6.89 years). As an incentive, participants were entered into a draw for one of three prizes of $125. We expected an important dropout rate between both waves of the study, since our only way of contacting participants was through their university email. Therefore, all students who had been out of school by that time had lost access to their institutional email. As expected, there was a dropout rate of 72%. A Little's MCAR missing data analysis revealed that there was no difference on all Time 1 data between those who dropped out and those who did not.

Measures

The measures were exactly the same at Times 1 and 2.

Identity processing style

The Identity Style Inventory-3 (ISI-3; Berzonsky, 2011) was used to assess participants' IPS. The ISI-3 is a 40-item scale measuring informational, normative, commitment, and diffuse IPS. Bouizegarene and Philippe (2016) adapted items of the original ISI-3 to tap friend IPS, but only used the first two dimensions, which resulted in an 8-item scale with the informational and normative dimension comprising four items each (the original items and their adapted version are shown in Appendix A). Participants were asked to rate all items on a 5-point Likert scale (1 = *do not agree at all*; 5 = *totally agree*). McDonald's Omega coefficients (McDonald, 1999) were computed using the R software.[2] They were .69 for Time 1 informational IPS, .62 for Time 1 normative IPS, .66 for Time 2 informational IPS, and .65 for Time 2 normative IPS, thus indicating adequate internal consistency.[3]

Friend satisfaction

We adapted the items of the Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) to assess satisfaction in the friend domain. Sample items for satisfaction in the friend domain are "In most ways my friendships are close to my ideal" and "I am satisfied with my friends." All items were averaged in an index measuring satisfaction in the friend domain. Omega coefficients were .94 at Time 1 and .95 at Time 2.

Self-defining memory

Participants described a memory related to the friend domain. Instructions were derived from past research on self-defining memories (Singer & Salovey, 1993) and asked to describe

> a personal memory of a specific event or moment that you experienced *with one or more of your current friends* which was significant (important) for you. Choose a memory that is at least three months old and that often comes to your mind. This memory can be positive, negative, or both.

At Time 2, participants were asked to report again a friend-related memory. They were told they could report the same memory they had described at Time 1 if they wanted to or describe a new memory that now appeared to them as more significant.

Ratings of memory characteristics

Participants were asked to rate a set of six items used in past research (Philippe et al., 2012, 2013) that measures the degree of need satisfaction they experienced at the moment the event of their memory occurred. Participants made their ratings on a 7-point Likert scale ranging from −3 (*Strongly disagree*) to +3 (*Strongly agree*). Two items assessed each of the three psychological needs postulated by self-determination theory (i.e., autonomy, competence, and relatedness). An item example is "I felt free to do things and to think how I wanted" for autonomy, "I felt confident of myself" for competence, and "I felt connected to one or more people" for relatedness. All items were averaged in an index measuring friend memory need satisfaction. Omega coefficients were .95 at Time 1 and .93 at Time 2.

Results

Table 1 presents the correlations. All variables at Time 1 were positively associated with their Time 2 counterpart, suggesting that they display some stability over time. Still, the associations between informational identity style, normative identity style, and friend satisfaction at Time 1 and 2 were all higher than the association between need satisfaction in memories at both times. Only 14 participants (8.5% of the sample) reported the same memory at both times. In addition, at Time 2, 96 participants (58.2% of the sample) reported a memory of an event that happened *before* the Time 1 measurement (which includes the 14 participants who reported the same memory) and 69 participants (41.8% of the sample) reported a memory of an event that happened *after* the Time 1 measurement. A chi-square test revealed that participants who reported at Time 2 a self-defining memory that happened before Time 1 were in a significantly greater proportion than participants who reported a memory that happened after Time 1, which were in a significantly greater proportion than participants who reported the same memory at Times 1 and 2, χ^2 (2, $N = 165$) = 61.13, $p < .05$. We created two dummy-coded variables representing whether participants reported the same memory or not and whether the participants reported a memory at Time 2 that concerned an event that happened *before* Time 1 measurement or that happened *after* Time 1. These variables did not significantly alter or moderate any of the present results and neither did excluding the participants who reported the same memory. Overall, these results show that old memories, not only newly experienced events, can be elected as self-defining memories and replace previous self-defining memories. It also suggests that self-defining memories of events can come from any point in time but still have the same directive function for the individual.

A path analysis was tested in Mplus 7. The exogenous variables were friend informational IPS, friend normative IPS, friend memory need satisfaction, and friend satisfaction measured at Time 1. The endogenous variables were these same four variables measured at Time 2. All measures at Time 1 were modeled to predict all measures at Time 2. The model was just identified. Fit indices are therefore not reported. Figure 1 shows our model. Again, friend memory need satisfaction, friend informational IPS, friend normative IPS, and friend satisfaction at Time 1 were all positively associated with their respective Time 2 counterpart. Importantly, the coefficient between memory need satisfaction at both times was small, while those of processing style and friend satisfaction were medium to large. Contrast tests revealed that the coefficient for memory need satisfaction was indeed smaller than all other coefficients (informational: $z = 1.71$, $p_{\text{one-tail}} < .05$; normative: $z = 3.11$, $p_{\text{one-tail}} < .001$; friend satisfaction $z = 3.53$, $p_{\text{one-tail}} < .001$). This finding shows that self-defining memories are

Table 1. Means, standard deviations, and correlations among friend IPS, friend satisfaction, and friend memory need satisfaction.

Variables	M	SD	1	2	3	4	5	6	7	8
1. Friend IF identity	3.55	.60	–							
2. Friend IF identity T2	3.64	.60	.46**	–						
3. Friend NR identity	2.77	.74	.06	.03	–					
4. Friend NR identity T2	3.25	.67	.04	.15	.58**	–				
5. Friend satisfaction	3.64	.89	.36**	.22*	−.01	.05	–			
6. Friend satisfaction T2	3.91	.65	.25*	.32**	−.03	.14	.54**	–		
7. Friend-memory NS	1.26	1.56	.14	.21*	−.06	−.01	.16*	.21*	–	
8. Friend-memory NS T2	1.09	1.53	.12	.16*	−.09	.08	.13	.25**	.24**	–

Notes: NS = need satisfaction; IF = informational; NR = normative; T1 = Time 1; T2 = Time 2.
*$p < .05$; **$p < .01$.
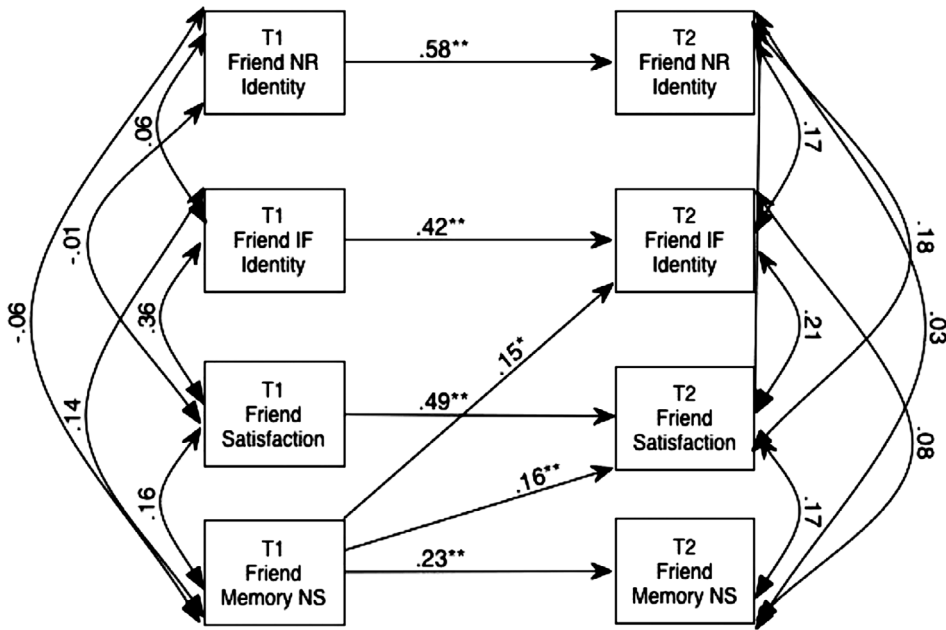
Figure 1. Path analysis model of the standardized beta coefficient of the associations among friend memory need satisfaction at Time 1, friend IPS at Time 1, friend satisfaction at Time 1, and those same variables measured at Time 2.
Notes: Non-significant associations were not shown for the sake of clarity. NS = need satisfaction; IF = informational; NR = normative; T1 = Time 1; T2 = Time 2; *p < .05; **p < .01.

particularly flexible: in about two years, for most of the participants, new self-defining memories became available to participants and replaced their older self-defining memories. This suggests that self-defining memories are personal characteristics (Conway, 2005) that change faster than higher-level variables such as identity styles and life satisfaction, which are more stable over time (for a discussion of the relation between episodic and higher levels of experience, see Milyavskaya, Philippe, & Koestner, 2013).

More importantly, friend memory need satisfaction at Time 1 positively predicted the change in friend informational IPS from Times 1 to 2 (R^2 = .03), and the change in friend satisfaction from Times 1 to 2 (R^2 = .05), but not in normative IPS at Time 2. Neither informational nor normative IPS predicted increases in memory need satisfaction or in friend satisfaction. The model was respecified by dropping the non-significant paths. Fit indices for this model were satisfactory, χ^2 (10, N = 165) = 6.97, p = .73, Standardized Root-Mean-Square Residual (SRMR) = .036, Root-Mean-Square Error Of Approximation (RMSEA) = .000 [.000; .063], Comparative Fit Index (CFI) = 1.00, and Tucker-Lewis Index (TLI) = 1.00. All significant paths from the previous model remained significant at the same p level. These results suggest that the paths over time from both IPS variables to memory need satisfaction and friend satisfaction are not significantly different from zero. This provides evidence for the directive effect of self-defining memories in identity, such that a self-defining memory seems to influence the kind of identity processes that will be adopted in the future. In contrast, identity styles did not prospectively influence the characteristics of self-defining memories that were to be elected.

Discussion

The present study sought to examine the direction of the effects in the association between self-defining memory and IPS. Results revealed that memory need satisfaction significantly predicted increases in informational IPS, but that it was not associated with normative IPS. Moreover, neither informational nor normative IPS predicted increases in memory need satisfaction, that is, the election of a friend-related memory characterized by greater or lower need satisfaction. This provides evidence that the direction of the relation between identity processes and memory might preponderantly be that of memory towards identity processes, at least with regards to need satisfaction in memory and informational IPS. In other words, the present cross-lagged panel study suggests that need satisfaction in a single important memory facilitates and increases the use of informational IPS over time, but using an informational IPS might not significantly influence the level of need satisfaction in future memories. This adds to evidence that personal memories influence the individual and can represent a personal resource (Pillemer, 2003; Philippe et al., 2012, 2013). Still, this asymmetry of influences between IPS and memories might be specific to this study, which measures friend memory need satisfaction and friend specific IPS in young adults. Therefore, further research in other contexts than friendships, using other identity and memory constructs, and with another type of population is needed to better highlight the processes underlying identity and memory in general.

The present results suggest that self-defining memories change much quicker than IPS and domain satisfaction over time. Over about two years, 91.5% of the friend-related memories initially elected as highly significant were replaced by different, more significant ones. In addition, these memories were not characterized by the same level of need satisfaction, as shown by the weak correlation between the need satisfaction ratings at Times 1 and 2. This suggests that memories have a directive function for some time (Pillemer, 1998) during which they build presumably more abstract autobiographical knowledge, attitudes, and traits (Conway & Pleydell-Pearce, 2000). Once this is accomplished, the access to these episodic memories is potentially lost and new memories that are closer to the person's actual goals and concerns are elected. As shown by the findings of this study, this dynamic process appears to occur pretty quickly in the friendships of young adults. Indeed, in only two years, the friend-related memories elected at Time 1 seem to have oriented the increases in informational IPS and in friendship satisfaction, as a function of the level of need satisfaction characterizing them.

Our findings also show how self-defining memories change over time. At Time 2, we found that 58.2% of participants chose a friendship self-defining memory that occurred before Time 1. This suggests that self-defining memories do not spawn exclusively from newly experienced events and instead can be replaced by older memories. Thus, self-defining memories might not be elected based on a chronological principle by which recent events will more probably become self-defining memories. Instead, it seems that at any moment, memories from all of one's past can become self-defining. This is consistent with Conway, Singer, and Tagini's (2004) model, which suggests that self-defining memories are elected from the autobiographical knowledge base to represent the person's ongoing concerns and goals (Conway, Singer, & Tagini, 2004).

We replicated past research that need satisfaction is associated with openness towards self-relevant information (Deci & Ryan, 2000) herein characterizing informational IPS

(Berzonsky, 2011; Soenens, Berzonsky, Dunkel, Papini, & Vansteenkiste, 2011). Our study extends those results by showing that this association holds when need satisfaction is assessed in self-defining memories, when these IPS are contextualized in friendships, and within a prospective design. Also, we replicated research showing that need satisfaction in self-defining memories leads to positive outcomes (Philippe et al., 2012, 2013), herein friend satisfaction. We extend those findings by showing that need satisfaction in self-defining memories predicts increases over time in these positive outcomes, which reaffirms the directive role of self-defining memories in structuring life outcomes (Pillemer, 2003). Taken together, these results suggest that the effect of need satisfaction on openness and informational IPS may come in part from the way some specific past events have been experienced, encoded, and elected as important by the person. These results therefore add to self-determination theory by underscoring a novel factor – memories – that could influence people's perceptions of need satisfaction and feelings of openness.

Limitations

Our study limitations ought to be underscored. First, the use of self-report methodologies might have increased the associations among the variables, due to shared method variance. Second, our sample has low ecological validity in that it is mostly composed of female students. Third, it is still unclear whether memories influence IPS in middle-age adults or older adults and whether IPS can still change at that age over a short period of time (two years). Future research should be conducted using a sample more representative of the general population and examine the relationship between memories and IPS in older ages.

In conclusion, this study suggests that satisfaction of the needs for autonomy, relatedness, and competence in a remembered self-defining memory in the context of friendship is prospectively associated with the increasing adoption of an informational IPS with regards to friends as well as with increased satisfaction with friends.

Notes

1. This study is the follow-up of a previous study (Bouizegarene & Philippe, 2016) in which we assessed identity styles, self-defining memories, and life satisfaction in two domains: friendships and school. The domain of friendship accommodates a longitudinal study very well, because people tend to have friends regardless of the period of their lives. In contrast, the school domain could become irrelevant at Time 2 for some participants if they have abandoned or completed their academic program. For this reason, only the friendship domain was tested.
2. The Cronbach's alpha coefficient formula is strongly affected by the number of items of a scale (Cronbach, 1951) such that scales with fewer items have lower alphas. Research suggests that the alpha systematically underestimates internal consistency, and that Mcdonald's Omega represents a more precise indicator of internal consistency (e.g., Dunn, Baguley, & Brunsden, 2014; Zinbarg, Revelle, Yovel, & Li, 2005). Considering that all the scales we use in the present study are composed of a low number of items we chose to use the Mcdonald's Omega indices.
3. The Omega coefficient is interpreted in the same way the alpha coefficient is.

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Appendix A

The Identity Style Inventory-3: Original items and friend-specific adaptation

1. Original item: I've more-or-less always operated according to the values with which I was brought up.

Adapted item: I've more-or-less always chosen my friends according to the values with which I was brought up.

2. Original item: When I have a personal problem, I try to analyze the situation in order to understand it.

Adapted item: When I have a problem with my friends, I try to analyze the situation in order to understand it.

3. Original item: I think it's better to have fixed values, than to consider alternative value systems.

Adapted item: I think it's better to have fixed friendships, than to consider alternative friendships.

4. Original item: I find that personal problems often turn out to be interesting challenges.

Adapted item: I find that problems that concern my friends often turn out to be interesting challenges.

5. Original item: Once I know the correct way to handle a problem, I prefer to stick with it.

Adapted item: Once I know the correct way to handle a problem with my friends, I prefer to stick with it.

6. Original item: When I have to make a decision, I like to spend a lot of time thinking about my options.

Adapted item: When I have to make a decision that concerns my friends, I like to spend a lot of time thinking about my options.

7. Original item: I prefer to deal with situations where I can rely on social norms and standards.

Adapted item: I prefer to deal with social situations where I can rely on social norms and standards.

8. Original item: I like to have the responsibility for handling problems in my life that require me to think on my own.

Adapted item: I like to have the responsibility for handling problems with my friends that require me to think on my own.

Dimension key

Normative identity style (1, 4, 5, 7) Informational identity style (2, 4, 6, 8).