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Assessing the reliability of change: A comparison of two measures of adult attachment

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ABSTRACT

Recently attachment researchers have become interested in how attachment changes within an individual due to social or cognitive context fluctuations. Such analyses of process are limited by unreliability of change scores. Traditional estimates of between-person reliability (Cronbach's alpha) are not informative about how reliable a measure is at capturing within-person change. In two longitudinal studies, we examined the reliability of the State Adult Attachment Measure (SAAM; Gillath, Hart, Noftle, & Stockdale, 2009) and the Experiences in Close Relationships scale (ECR; Brennan, Clark, & Shaver, 1998), in capturing attachment change. We used generalizability theory analyses to estimate the between- and within-person reliabilities of both scales. Even with fewer items, the reliability of change for the SAAM was higher than that of the ECR.

1. Introduction

Attachment theory was first developed by Bowlby (1969, 1973, 1979) to explain the bonds between infants and caretakers and the impact of that bond on subsequent adjustment and behavior. Bowlby proposed that children develop expectations or "working models" about the availability of close others in general based on the responsiveness and availability of their primary caregiver. Children who receive consistent and attentive care from their caregiver develop a secure way of relating to others, expecting that close others will be available in times of need and believing that they themselves are worthy of love and care. Children who receive inconsistent care or attention from a caregiver are thought to develop an anxious–ambivalent attachment style, resulting in an individual who desires to be close to others but who fears rejection from them at the same time. Children who receive little attention or who have caregivers who are cold and unavailable tend to develop an avoidant style; these individuals desire to be independent and prefer not to get too close to others.

Because attachment is thought to be relatively stable throughout the lifespan, the majority of work in the attachment domain has focused on between-person differences, i.e. how individuals differ from one another at a given point in time in their attachment style. In the past two decades though, research has begun to support the idea that attachment can be influenced by life events (Davila & Sargent, 2003; Feeney & Noller, 1992) and contextual factors (Baldwin & Fehr, 1995; Gillath & Shaver, 2007). Feeney and Noller (1992) found that participants who formed a steady relationship over the course of 10 weeks were more likely to report increases in attachment security and decreases in attachment insecurity. Similarly, Kirkpatrick and Hazan (1994) showed that for individuals who were initially classified as avoidant, those who formed a new relationship were less likely to remain avoidant over a span of 4 years, than were those who did not. In addition, relationship breakup was associated with changes from secure to insecure attachment. Priming studies have also shown that attachment can be manipulated momentarily (Gillath, Selcuk, & Shaver, 2008; Mikulincer & Shaver, 2007). For example, Gillath et al. (2006) found that priming participants with a security-enhancing attachment figure (vs. a neutral prime) was associated with increased willingness to self-disclose on a subsequent task. In addition, priming security has been shown to result in positive relationship expectations and affect (Rowe & Carnelley, 2003) and repeated security priming has been shown to have effects even 2 days after the priming manipulation. Participants repeatedly primed with security reported more positive relationship expectations, more positive self-views, and less attachment anxiety than those primed with neutral primes (Carnelley & Rowe, 2007).

In the studies described above, changes in attachment were typically assessed using traditional trait measures, such as the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991), the Experiences in Close Relationships scale (ECR; Brennan et al., 1998) and its revised version, the Experiences in Close Relationships scale – Revised (Fraley, Waller, & Brennan, 2000). Such scales however, were not designed to assess state-like changes in attachment or to be able to capture momentary fluctuations over time

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since they ask individuals to reflect on how they "generally experience relationships". For example, sample items from the ECR include: "I am very comfortable being close to romantic partners" and "I worry about being abandoned". These items do not focus on a specific time frame but instead ask individuals to access a cognitive representation of who they are or how they experience close relationships in general, and it is known that representations of the self are often resistant to change (Greenwald, 1980; Markus, 1977). Gillath et al., 2009 argued that measures, such as the ECR, activate generalized, abstracted working models at the expense of momentary models. Thereby, a scale that could capture more state-like changes in attachment was needed.

To capture temporary changes in attachment security and insecurity, Gillath and his team designed the State Adult Attachment Measure (SAAM; Gillath et al., 2009). Participants reported on 21 items that measured attachment-related security, anxiety, and avoidance. The SAAM asks participants to focus on their current feelings "right now" and "at the moment". In addition to the instructions that ask participants to focus on how they are currently feeling, the SAAM items were also written to emphasize a state-focused context, for example, "I really need to feel loved right now" or "If something went wrong right now I feel like I could depend on someone". These aspects of the SAAM should make it more sensitive than the ECR in assessing change in attachment over time.

In studies of an undergraduate population, Gillath et al. (2009) reported internal consistency of the SAAM as well as test–retest reliability. Internal consistency (Cronbach's alpha) was adequate, .83 for the avoidance subscale, .84 for the anxiety subscale and .87 for the security subscale. Gillath and colleagues also reported test–retest reliability as being in the range of .51–.59 for each of the three subscales. They described these estimates as "optimal", because change in individuals from one measurement to the next would result in lower consistency between assessments. These reliabilities provide important information about how well the SAAM is able to capture between-person differences by taking information across persons. However, these reported reliabilities do not explicitly tell us about the reliability of the SAAM in capturing changes in attachment within an individual over time.

Reliability of change is a concept that has been a challenge to psychology for decades (Cronbach & Furby, 1970). Reliability is formally defined as the ratio of signal variance to the total variance (signal variance plus noise variance). Classical test theory estimates this quantity as the ratio of true score variance divided by total variance (Crocker & Algina, 1986). In assessing reliability of change, the challenge is in determining how to characterize true score variance and total variance in relation to change. Generalizability theory (GT; Brennan, 2001) provided the tools for answering this question and in the past 15 years different methods of assessing within-person change have emerged (Cranford et al., 2006; Laenen, Alonso, & Molenberghs, 2007; Laenen, Alonso, Molenberghs, & Vangeneugden, 2009; Nezlek & Gable, 2001; Wilhelm & Schoebi, 2007).

In the current study we sought to examine the reliability of change of the SAAM scales and to compare it to a commonly used trait measure of attachment – the Experiences in Close Relationships scale (ECR). Because Gillath et al. (2009) constructed the SAAM items to be sensitive to momentary changes, we expect the SAAM to be more reliable in measuring change than the ECR when adjustments are made for the number of items used in each scale. We used the Cranford method, which breaks down item response variation into different components, allowing for the separation of within-person variation from between-person variation and error.

First, we estimate the reliability of the SAAM scale using a longitudinal study of undergraduates and compare that with the reliability of a version of the ECR that contained the same number of items per subscale as the SAAM (Study 1). Then in Study 2, to see if the ECR is better able to capture change with more items, we examine the reliability of change of the full 36-item ECR scale. We compare the resulting reliabilities of change and make recommendations for researchers interested in studying attachment processes over time. Before we proceed to the empirical results, we first briefly review the GT approach for estimating the reliability of change that was described by Cranford et al. (2006).

2. Generalizability theory approach to the reliability of change

Cranford et al. (2006) used the GT framework to decompose the item response variance into different components such as item variance, time variance, person variance, person by time variance, item by time variance, person by item variance, and error. In their formal analysis, an individual's response on a given attachment item at a given time can be represented as A_{ipt}, where i refers to the item, p to the person, and t to the time point, and that response can be decomposed into different components as shown in the following equation:

$$A_{ipt} = \mu + P_p + T_t + I_i + (PT)_{pt} + (IP)_{ip} + (IT)_{it} + e_{ipt} \quad (1)$$

In the equation, μ is the grand mean, averaged over all participants, items and time points in the study design. P_p is the tendency for a person to report higher or lower ratings over all items and time, and captures differences between individuals representing the between-person variation that is traditionally studied. T_t is the tendency for specific time points to have higher or lower ratings across items and persons. For example, all freshmen may report feeling more lonely when they first arrive at college in the fall than in the spring semester. Finally, I_i is the tendency for an item to be endorsed more or less highly across persons and time points. For example, a hypothetical item "I sometimes feel lonely" would get higher endorsements on average than "I always feel completely abandoned."

The term $(PT)_{pt}$ in Eq. (1) represents how a person's attachment level varies over time (averaging across items). This interaction between person and time is the most interesting for our purposes because it represents the change variation that is of importance to those studying psychological process. It is already adjusted for the tendency of some persons to be high or low in attachment (the aforementioned P_p), and the tendency for attachment to be globally higher or lower on certain days (the aforementioned T_t). The next interaction, $(IP)_{ip}$, represents how item i is rated higher or lower over time by person p, and $(IT)_{it}$, is how item responses vary over time averaged across persons. The three-way interaction represents how item responses differ for persons over time points $(IPT)_{ipt}$, however, since each item is only assessed once per time point, the three-way interaction cannot be separated from error (e_{ipt}). Cranford et al. (2006) use the three way interaction to estimate the underlying response error.

Eq. (1) is used by variance decomposition software to estimate the variance associated with each term of the equation. These variance components can be used to construct different reliability measures according to principles of GT (Brennan, 2001). Traditional between person reliability (assuming that days and items do not vary across persons, i.e. are fixed) is defined as follows in the GT framework:

$$R_{1F} = \frac{\sigma^2_{PERSON} + [\sigma^2_{PERSON*ITEM}/m]}{\sigma^2_{PERSON} + [\sigma^2_{PERSON*ITEM}/m] + [\sigma^2_{ERROR}/m]} \quad (2)$$

Eq. (2) can be thought of as an average alpha coefficient (Cronbach, 1951) for a single day. The numerator contains the overall expected variation across persons on a set of m items, the second