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Assimilative and accommodative coping in older adults with and without sensory impairment: four-year change and prospective relations with affective well-being

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ABSTRACT

Objectives: Sensory impaired older adults may be particularly dependent on coping strategies such as assimilation (or tenacious goal pursuit [TGP]) and accommodation (or flexible goal adjustment [FGA]) to secure high levels of well-being. We investigated if late-life changes in these coping strategies and prospective associations of TGP and FGA with affective well-being vary according to sensory impairment status.

Method: Our study sample consisted of 387 adults aged 72–95 years (M = 82.50 years, SD =4.71 years) who were either visually impaired (VI; n = 121), hearing impaired (HI; n = 116), or sensory unimpaired (UI; n = 150). One hundred sixty-eight individuals were reassessed after approximately 4 years.

Results: Both VI and HI revealed a decrease in TGP, whereas TGP remained stable in UI. For FGA, a significant increase in HI was observed; whereas a significant decline emerged in UI. Controlling for age, gender, and cognitive abilities, higher TGP at baseline was significantly associated with higher negative affect 4 years later in VI. Moreover, the positive association between baseline FGA and subsequent positive affect was stronger in HI than in UI older adults.

Conclusion: Our findings suggest that older adults with sensory impairments reveal trajectories of assimilative and accommodative coping and associations of TGP and FGA with affective well-being that are different from sensory unimpaired individuals.

Introduction

According to the dual-process model of assimilative and accommodative coping (Brandtstädter, 2009; Brandtstädter & Rothermund, 2002), two modes of coping to reduce discrepancies between desired and achieved states can be distinguished. The assimilative mode (or tenacious goal pursuit, TGP) is characterized by persisting commitment to a goal, including instrumental, self-corrective, and compensatory efforts and activities. The accommodative mode (or flexible goal adjustment, FGA) can be described as adjustment of goals to existing constraints by means of disengagement from blocked goals, positive reappraisal of loss as well as lowering aspirations, ambitions, and standards.

Given that resources needed for TGP usually decline with age, necessitating disengagement from goals (and thus FGA) to a larger extent, the use of both self-regulative strategies may be subject to age-related change. Indeed, previous research has reported that individuals tend to less focused on tenaciously pursuing goals as they advance in age (Bailly, Hervé, Joulain, & Alaphilippe, 2012; Bailly, Joulain, Hervé, & Alaphilippe, 2012; Brandtstädter, 2015), whereas the experience of reduced lifetime seems to activate processes of accommodation (Brandtstädter, Rothermund, Kranz, & Kühn, 2010), so that endorsement of flexibly adjusting goals increases with age (Brandtstädter & Greve, 1994; Brandtstädter & Renner, 1990; Brandtstädter, Wentura, & Greve, 1993).

Associations of TGP and FGA with well-being

TGP and FGA are positively related with well-being measures, including indicators of affective well-being (Brennan-Ling, Boerner, Horowitz, & Reinhardt, 2013; Heyl, Wahl, & Mollenkopf, 2007; Mueller & Kim, 2004; Wahl, Becker, Schilling, Burmeli, & Himmelsbach, 2005). It thus seems that both TGP and FGA are necessary for adaptive and successful self-regulation, and individuals using a broader range of goal-management strategies (including assimilative and accommodative strategies) generally have the most favorable psychological and well-being outcomes (Arends, Bode, Taal, & van de Laar, 2016; Bailly et al., 2016; Haynes, Heckhausen, Chipperfield, Perry, & Newall, 2009; Heyl et al., 2007; Kelly, Wood, & Mansell, 2013; Preiser, Auth, & Buttkewitz, 2005). There is also evidence for modality-specific associations, such as a stronger relationship between TGP and positive affect than between FGA and positive affect, whereas negative affect is more strongly (negatively) associated with FGA than with TGP (Brandtstädter, 2015; Coffey, Gallagher, Desmond, & Ryall, 2014; Heyl et al., 2007; Wahl et al., 2005).
Coping with sensory impairment: shift in strategy use and altered role of TGP and FGA for well-being?

Coping and goal management strategies become particularly important for maintaining well-being when certain life events, such as the onset of a chronic condition, complicate the accomplishment of goals. Late-life impairments in hearing and vision deserve particular attention because they are among the most frequent chronic conditions in old age (Albers et al., 2015; Bainbridge & Wallhagen, 2014; Heyl & Wahl, 2014) and are associated with a higher risk of lower well-being (Bernoabi et al., 2011; Ciobra, Blanchini, Pelucchi, & Pastore, 2012; Gopinath et al., 2009).

We assume that the described overall age-related change trend toward higher FGA endorsement may be more pronounced in sensory impaired older adults who represent a particularly vulnerable group with limited resources for investment in TGP. In contrast, older adults without sensory impairment may be in a better resource situation and thus in less need of a strategy shift towards FGA, resulting in a less pronounced decrease in TGP and a less pronounced increase in FGA (compared to individuals with vision or hearing loss).

Importantly, many types of late-life sensory impairments, such as AMD or presbycusis, are not reversible. Therefore, because restoring vision or hearing (or other aims, such as continuing to drive a car in spite of severe macular degeneration) corresponds to an unattainable goal, assimilative strategies may become maladaptive in these goal contexts, resulting in a waste of resources and potentially in ego depletion (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister & Vohs, 2007) and ‘escalation of commitment’ (Brockner, 1992). Instead, accommodative coping approaches including goal disengagement processes may become more important and more adaptive when sensory impairment sets in. This maladaptive role of TGP may be more pronounced in vision impairment than in hearing impairment, because vision loss is a stronger risk factor for loss of autonomy and restrictions in functional ability than hearing impairment. Therefore, tenaciously pursuing goals such as undifferentiated continuation of engagement in different activities despite severe sensory impairment may be less successful, deplete more resources, and may result in lower well-being in the long run for visually impaired older adults than for hearing impaired individuals.

The two modes of coping have already been investigated in samples with sensory impairments. In one study with a sample of middle-aged adults with vision loss (Boerner & Wang, 2012), accommodative coping as a general coping strategy was associated with more beneficial mental health outcomes than was assimilative coping (see also Boerner, 2004; Brennan-Ing et al., 2013). Heyl et al. (2007) found that subjective vision impairment was associated with higher negative affect, but this relationship was less pronounced in individuals with high FGA. Moreover, high TGP only buffered the negative relationship between subjective vision impairment and positive affect when FGA was also high. However, high FGA alone was not sufficient for high positive affect levels in individuals with poor subjective vision. Maintenance of positive affect after the onset of visual impairment may thus require the use and orchestration of both TGP and FGA strategies. Only one study investigated change in self-regulatory strategies in sensory impairment (Wahl et al., 2005), but focused on vision loss only. In this study, a 1-year decline in TGP was observed in individuals with age-related macular degeneration (AMD), whereas FGA remained stable. Another study investigated TGP and FGA across groups of different sensory impaired status and observed lower TGP scores in visually impaired older adults compared to hearing impaired and sensory unimpaired individuals (Wahl et al., 2013), but was solely based on a cross-sectional design.

Research aims and hypotheses

In this study, we compare 4-year trajectories of TGP and FGA in visually impaired older adults (VI), hearing impaired older adults (HI), and in individuals without sensory impairment (UI). Moreover, we investigate how both coping strategies are prospectively associated with affective well-being indicators across the three sensory groups. Our expectations are as follows:

1. Regarding 4-year change in TGP and FGA, we expect a 4-year increase in FGA as well as a decrease in TGP in VI and HI individuals, with both change trends being more pronounced than in the UI group.
2. Higher TGP in the sensory impaired groups might be associated with lower subsequent affective well-being, and this negative association should be more pronounced in VI than in HI individuals. In contrast, the association between FGA and subsequent affective well-being is expected to be positive and stronger in both sensory impaired groups than in UI individuals.

Methods

Sampling strategy

Study participants (N = 387; 72–95 years, M = 82.50 years, SD = 4.71 years) were either sensory impaired (i.e. visually impaired or hearing impaired) or sensory unimpaired. We sampled exclusively old and very-old individuals (i.e. age >70 years), because the prevalence of sensory impairments is particularly high in this age group (Bainbridge & Wallhagen, 2014; Hong et al., 2013; Marsiske et al., 1999; Sörensen, White, & Ramchandran, 2015; Stevens et al., 2011). All participants were community dwelling and had no major cognitive impairment (i.e. a score of 7 or below on the 6CIT test; Brooke & Bullock, 1999).

Study participants with sensory impairments had to be impaired for at least 2 years prior to enrollment; this criterion was chosen in order to exclude study participants who may still be affected by the shock of a very recent diagnosis of sensory impairment. Vision and hearing were assessed in all individuals, including the sensory unimpaired control group (N = 150), to make sure that this subsample was indeed sensory unimpaired. Individuals with dual sensory impairment (i.e. impaired hearing and impaired vision) were excluded from analyses.

Detailed descriptions of the study design and of the sampling procedure have been provided elsewhere (Heyl & Wahl, 2012; Wahl et al., 2013). This study was approved by the Ethics Commission of the German Psychological Society.
The visually impaired group (N = 121) was recruited by drawing from pools of patients who had been treated in regional university clinics. They were contacted by invitation letters with detailed information about the aims and procedure of this study. This group had a best-corrected distance and/or near visual decimal acuity, assessed by vision charts, of ≤ 0.30 in the better eye (which corresponds roughly to 20/70 in metric used in the U.S.). No individual reported being affected by congenital vision loss.

The hearing impaired sample (N = 116) was also generated by drawing from the pools of outpatients from regional university clinics and was first contacted via invitation letters. This sample had an average hearing loss in decibel (dB HL) across the speech frequencies that was ≥ 35 dB HL in the better ear. Notably, nobody reported congenital hearing impairment.

Sensory unimpaired controls (UI) were enrolled from randomly generated address material drawn from the city registers of Heidelberg and Mannheim. The final UI sample size was N = 150.

Among those providing a reason for nonparticipation, main reasons reported were – across all three groups – health restrictions (27.5%) and ‘no interest’ (24.2%; further details are provided by Wahl, Drapaniotis, & Heyl, 2014). A sample description is provided in Table 1.

The second measurement wave (T2) took place approximately 4 years after the initial assessment (mean interval: M = 3.99 years, SD = 0.68 years). Most study participants could be tracked and re-contacted at the follow-up measurement occasion with the help from family members and official city registries; however, there were 14 individuals who were lost to follow-up because it was not possible to track and contact them. The final T2 sample size was n = 168 (visually impaired: 45, hearing impaired: 36, sensory unimpaired: 87). Main reasons for study dropout at T2 were health problems as well as ‘no interest’ in participating. Moreover, ninety-two individuals (23.8% of the baseline sample) had died between T1 and T2.

### Measures

#### Coping strategies

TGP and FGA were measured based on the assessment instrument developed by Brandtstädter and Renner (1990). Their scale consists of 30 items with a 5-point Likert-type scale format (ranging from 1 = ‘do not agree at all’ to 5 = ‘do fully agree’). Reliability estimates (Cronbach’s α) were .67 for both scales at T1, and .64 for TGP at T2 as well as .63 for FGA at T2.

### Affective well-being

Positive and negative affect were assessed based on the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988; positive affect: T1: x = .77, T2: x = .75; negative affect: T1: x = .80, T2: x = .82).

#### Control variables

We included age, gender, cognitive abilities, diseases, and activities of daily living (ADL) as control variables in the following analyses. As a measure of cognitive abilities, we computed a composite measure by averaging the z-transformed scores from five established tests (for details, see Wahl et al., 2013; Wettstein, Kuzma, Wahl, & Heyl, 2016), namely: ‘Counting Backwards’ (Tun & Lachman, 2006), ‘Digit Span Backwards’ (from the Wechsler Adult Intelligence Scale, WAIS-R; Tewes, 1991), ‘Number Series’ (from the ‘Cognitive Telephone Screening’, COGETL; Kliegel, Martin, & Jäger, 2007), ‘Animal Naming’, and ‘Similarities’ (from the WAIS-R; Tewes, 1991). For the assessment of the number of chronic conditions (e.g. cardiovascular disease, diabetes, cancer, rheumatism, thyroid disease), the Duke University Older Americans Resources and Services questionnaire (Pfeiffer, 1978) was used. The ADL scale (x = .88) used in this study consisted of ten everyday activities, such as public transportation, shopping, or walking for 2 km. The item response format was: 2 (possible without difficulty), 1 (possible only with difficulty), and 0 (only possible with the help of others).

### Results

#### Four-year change in TGP and FGA across the groups of sensory impaired and unimpaired individuals

When comparing 4-year change across groups based on repeated-measures analysis of variance, the main effects of sensory groups (F [2, 165] = 3.89, p = .022) and of time (F [1, 165] = 33.54, p < .001) reached significance. The effect of time indicates a significant decline in TGP when considered across all three groups. Regarding the main effect of group, Bonferroni post-hoc contrasts revealed that VI individuals scored significantly lower on TGP than the HI group, whereas UI older adults did not significantly differ from any group.

In addition, and in accordance with our expectation, the interaction effect of time and sensory groups was significant (F [2, 165] = 9.44, p < .001), indicating that 4-year change in TGP varied across the groups: As illustrated by Figure 1, for VI and HI individuals, there was a significant

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**Table 1. Sample description.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>VI</th>
<th>HI</th>
<th>UI</th>
<th>Statistical test</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>387</td>
<td>121</td>
<td>116</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Age (M, SD)</td>
<td>82.50 (4.71)</td>
<td>82.60 (4.63)</td>
<td>82.69 (5.08)</td>
<td>82.26 (4.50)</td>
<td>F (2, 384) = .032, ns</td>
</tr>
<tr>
<td>Gender: male (%)</td>
<td>194 (50.10)</td>
<td>50 (41.30)</td>
<td>68 (58.60)</td>
<td>76 (50.70)</td>
<td>χ² (2) = 7.12, p = .03</td>
</tr>
<tr>
<td>Education (years) (M, SD)</td>
<td>9.54 (2.04)</td>
<td>9.21 (1.84)</td>
<td>9.74 (2.21)</td>
<td>9.65 (2.03)</td>
<td>F (2, 384) = 2.44, p = .09</td>
</tr>
<tr>
<td>Perceived health¹ (M, SD)</td>
<td>2.62 (0.84)</td>
<td>2.78 (0.86)</td>
<td>2.62 (0.84)</td>
<td>2.49 (0.79)</td>
<td>F (2, 384) = 4.27, p = .02</td>
</tr>
<tr>
<td>Diseases (M, SD)</td>
<td>2.78 (2.15)</td>
<td>3.00 (2.27)</td>
<td>2.90 (2.17)</td>
<td>2.52 (2.01)</td>
<td>F (2, 384) = 1.92, ns</td>
</tr>
<tr>
<td>Tenacious goal pursuit (M, SD)</td>
<td>3.01 (0.49)</td>
<td>2.90 (0.45)</td>
<td>3.07 (0.52)</td>
<td>3.06 (0.48)</td>
<td>F (2, 383) = 5.13, p = .006</td>
</tr>
<tr>
<td>Flexible goal adjustment (M, SD)</td>
<td>3.84 (0.44)</td>
<td>3.84 (0.45)</td>
<td>3.83 (0.48)</td>
<td>3.83 (0.44)</td>
<td>F (2, 383) = 0.09, ns</td>
</tr>
</tbody>
</table>

Note: VI, visually impaired older adults; HI, hearing impaired older adults; UI, sensory unimpaired individuals.

Statistic test for differences: t-test (means) and Chi-square test (frequencies); not significant = ns.

¹Lower values correspond to better perceived health. Groups with different superscripts are significantly different from each other (based on Bonferroni post-hoc comparisons).
decline (VI: \( t[44] = 4.32, p < .001 \); HI: \( t[35] = 3.75, p = .001 \)), whereas change was not significant in the UI group \( (t[86] = 0.31, p = .76) \).

For FGA, repeated-measures analysis of variance revealed a main effect of sensory group which was marginally significant \( (F[2, 165] = 2.95, p = .055) \), with the HI group scoring higher than both other groups (see Figure 1). The main effect of time did not reach significance \( (F[1, 165] = 1.22, p = .27) \), implying that when considered across the total sample, FGA remained stable over 4 years. However, as expected, the interaction effect of time and sensory group was significant \( (F[2, 165] = 5.12, p = .007) \): As can be seen in Figure 1, in the VI group, there was no significant 4-year change \( (t[44] = −0.48, p = .56) \), whereas a significant increase was found in the HI group \( (t[35] = −2.59, p = .01) \), and in the UI group, there was a significant decline \( (t[86] = 2.35, p = .02) \).

To investigate whether these group-differential changes in goal management strategies remain significant when adjusting for covariates, we ran regression models with T2 TGP and T2 FGA as outcomes and sensory groups as predictors, with baseline TGP/FGA, gender, age, diseases, ADL, and cognitive abilities as additional predictors (see Table 2). Notably, sensory-group status was found to prospectively predict both modes of coping (TGP: \( β_{VI} = −.25, p < .01; β_{HI} = −.18, p < .01 \); FGA: \( β_{VI} = .18, p < .05; β_{HI} = .25, p < .001 \)), above and beyond all other predictors included (as was also indicated by significant \( ΔR^2 \) scores when including sensory groups as additional predictors; TGP: \( ΔR^2 = .05, p < .01 \); FGA: \( ΔR^2 = .06, p < .01 \)). Specifically, being sensory impaired (either VI or HI) was significantly associated with lower T2 TGP and with higher T2 FGA compared to being sensory unimpaired.

**Associations between TGP/FGA and subsequent affective well-being: the role of sensory-impairment status**

Next, we ran regression analyses with T2 affective well-being (positive and negative affect) as outcome variable. Regarding the effects of the cognitive, socio-demographic, and health-related predictors (see Table 3), age was significantly negatively associated with T2 negative affect. Moreover, both T2 positive and negative affect were again significantly lower in VI compared to UI individuals. Higher baseline TGP was significantly associated with higher T2 positive affect. Finally, the two interaction effects between sensory-group membership and coping strategies were significant (see Figure 2): FGA was more strongly associated with later positive affect in HI than in UI individuals, whereas higher TGP was associated with higher subsequent negative affect in the VI group, but not in the UI group.

**Discussion**

In this study, we investigated 4-year change in TGP and FGA in older adults with impaired vision or hearing in comparison with sensory unimpaired controls as well as the prospective associations of both strategies with affective well-being. Our assumption that the three groups will reveal different mean-level change trends in TGP and FGA was confirmed. Specifically, there was a general trend of TGP decline over 4 years in the total sample, which is in line with previous research (Bailly, Hervé, et al., 2012; Bailly, Joulin, et al., 2012; Brandstädter, 2015). However, these previous studies did not differentiate between groups of different sensory status. In our sample, a comparison of the three groups revealed that TGP significantly decreased only in both sensory impaired groups (VI and HI), whereas no significant change occurred in the UI group. Similarly, change in FGA varied as a function of sensory group, with no significant change in VI older adults, a significant increase in HI individuals, and a significant decline in UI older adults.

Our finding of decline in accommodative coping in sensory unimpaired older adults is in some contradiction with other findings which actually reported an increase with advancing age (Brandstädter & Greve, 1994; Brandstädter & Renner, 1990; Brandstädter et al., 1993). However, most of these findings were based on cross-sectional data and may therefore reflect effects of cohort rather than of aging. Moreover, studies did not differentiate between sensory impairment groups so that group-differential age trends may be blurred, resulting in an overall increase with age.

In some contrast to our expectation, a significant increase in FGA was observed only in the HI group, but not in the VI...
Table 2. Predictors of tenacious goal pursuit and flexible goal adjustment (T2).

<table>
<thead>
<tr>
<th></th>
<th>Tenacious goal pursuit (T2)</th>
<th>Flexible goal adjustment (T2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1: TGP / FGA T1</td>
<td>(\Delta R^2) .37***</td>
<td>.26**</td>
</tr>
<tr>
<td>Block 2: + gender, age, diseases, ADL, cognitive abilities</td>
<td>(\Delta R^2) .04</td>
<td>.04</td>
</tr>
<tr>
<td>Block 3: + VI vs. UI, HI vs. UI</td>
<td>TGP/FGA T1 (\Delta R^2) .60***</td>
<td>.51***</td>
</tr>
<tr>
<td></td>
<td>Gender (^a)</td>
<td>(-.07)</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>(-.10)</td>
</tr>
<tr>
<td></td>
<td>Diseases</td>
<td>(-.01)</td>
</tr>
<tr>
<td></td>
<td>ADL</td>
<td>(+.02)</td>
</tr>
<tr>
<td></td>
<td>Cognitive abilities</td>
<td>(+.09)</td>
</tr>
<tr>
<td></td>
<td>VI vs. UI</td>
<td>(-.25**)</td>
</tr>
<tr>
<td></td>
<td>HI vs. UI</td>
<td>(-.18**)</td>
</tr>
<tr>
<td></td>
<td>TGP, FGA</td>
<td>(+.06**)</td>
</tr>
<tr>
<td></td>
<td>(R^2) (total)</td>
<td>.46</td>
</tr>
</tbody>
</table>

Note. VI, older adults with visual impairment; HI, older adults with hearing impairment; UI, sensory unimpaired older adults; TGP: tenacious goal pursuit, FGA: flexible goal adjustment.

\(^a\) 0 = male, 1 = female.
\(^* p < .05; ^{**} p < .01; ^{***} p < .001\)

Table 3. Predictors of affective well-being (T2).

<table>
<thead>
<tr>
<th></th>
<th>Positive affect (T2)</th>
<th>Negative affect (T2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1: T1 positive/neg. affect</td>
<td>(\Delta R^2) .26***</td>
<td>.41***</td>
</tr>
<tr>
<td>Block 2: + gender, age, diseases, cognitive abilities</td>
<td>(\Delta R^2) .03</td>
<td>.02</td>
</tr>
<tr>
<td>Block 3: + VI vs. UI, HI vs. UI</td>
<td>TGP/FGA (\Delta R^2) .04*</td>
<td>.03*</td>
</tr>
<tr>
<td>Block 4: + TGP, FGA</td>
<td>(\Delta R^2) .07***</td>
<td>.00</td>
</tr>
<tr>
<td>Block 5:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>T1 positive/neg. affect</td>
<td>(\Delta R^2) .32***</td>
</tr>
<tr>
<td></td>
<td>Gender (^a)</td>
<td>(-.05)</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>(-.09)</td>
</tr>
<tr>
<td></td>
<td>Diseases</td>
<td>(-.08)</td>
</tr>
<tr>
<td></td>
<td>Cognitive abilities</td>
<td>(-.06)</td>
</tr>
<tr>
<td></td>
<td>VI vs. UI</td>
<td>(-.19**)</td>
</tr>
<tr>
<td></td>
<td>HI vs. UI</td>
<td>(-.06)</td>
</tr>
<tr>
<td></td>
<td>Tenacious goal pursuit (TGP)</td>
<td>.26**</td>
</tr>
<tr>
<td></td>
<td>Flexible goal adjustment (FGA)</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>FGA(^a) HI vs. UI</td>
<td>(-.04)</td>
</tr>
<tr>
<td></td>
<td>TGP(^a) HI vs. UI</td>
<td>(-.05)</td>
</tr>
<tr>
<td></td>
<td>TGP(^a) HI vs. UI</td>
<td>(-.03)</td>
</tr>
<tr>
<td></td>
<td>(\Delta R^2)</td>
<td>(-.02)</td>
</tr>
<tr>
<td>(R^2) (total)</td>
<td></td>
<td>.41</td>
</tr>
</tbody>
</table>

Note. VI: visually impaired older adults; HI: hearing impaired older adults; UI: sensory unimpaired individuals; TGP: tenacious goal pursuit; FGA: flexible goal adjustment.

\(^a\) 0 = male, 1 = female.
\(^* p < .05; ^{**} p < .01; ^{***} p < .001\)

In line with our assumptions, associations of baseline coping modes with affective well-being after 4 years were also to some extent moderated by sensory status: The association of FGA with T2 positive affect was stronger in HI than in UI older adults. Older adults with hearing loss may thus particularly benefit from accommodative strategy use with regard to their later positive affect. In support of this assumption, studies focusing on chronic conditions other than hearing loss (or on negative life events; Bailly, Joulain, et al., 2012) have also reported a close link between FGA and outcomes of well-being and mental or psychological health (Hall, Chipperfield, Heckhausen, & Perry, 2010; Schmitz et al., 1996; van Lankveld et al., 2011). However, unexpectedly, we did not find a closer association between baseline FGA and T2 affect in VI older adults, although vision loss also represents a chronic condition. Again, vision loss may be regarded as the ‘more severe’ sensory impairment compared to hearing loss, with stronger implications for everyday life and functional ability. Therefore, the mere use of FGA alone may not be sufficient to maintain affective well-being after the onset of vision impairment; rather, a specific ‘coping repertoire’ (Arends et al., 2016; Bailly et al., 2016; Haynes et al., 2009; Heyl et al., 2007; Kelly et al., 2013; Preiser et al., 2005).
including an optimal orchestration of accommodative, assimilative and other goal management strategies, may be needed. In addition, other personal resources beyond coping abilities, such as cognitive abilities (Wettstein, Wahl, & Heyl, 2015) or personality traits (Wahl, Heyl, & Schilling, 2012), may gain importance for well-being (and also for functional ability; Heyl & Wahl, 2010, 2012; Wettstein, Wahl, & Heyl, 2017) when older adults are affected by visual impairment.

Another ‘sensory-moderation effect’ occurred regarding the association between baseline TGP and T2 negative affect, which was positive in the VI group, but negative in UI older adults. This finding is in line with our assumption that tenaciously pursuing goals may be maladaptive in older adults with vision loss and result in lower affective well-being, potentially due to the frustrating experience of unattainable goals despite high TGP efforts and extensive resource investment. Other studies have also found that when coping with chronic conditions, assimilative coping modes are negatively associated with well-being and psychological health outcomes (Arends et al., 2016; Hall et al., 2010).

However, the role of TGP for subsequent well-being in older adults with vision loss seems to be more complex, as TGP was significantly positively associated with later positive affect in the total sample (including the VI group). TGP investment after the onset of late-life visual impairment thus seems to be a source of both positive and negative affect, perhaps because TGP efforts contribute to the achievement of some goals, which is beneficial for positive affect, but also to non-adaptive resource investment in other, unattainable goals, which contributes to higher negative affect. Future research should therefore investigate the role of specific goals for the direction of associations between TGP and affective well-being in visually impaired older adults.

The positive association between TGP and later negative affect occurred only for individuals with vision loss. As hearing loss may be less disabling than vision loss, hearing impaired older adults with high TGP strivings may still succeed in accomplishing their goals (or at least some of them), so that no detrimental effects with regard to later affective well-being emerges.

Our results may, to some extent, explain inconsistencies in previous research findings, particularly regarding consequences and correlates of late-life sensory loss. Specifically, some studies report that hearing loss is associated with lower well-being and poorer mental health (e.g. Bernabei et al., 2011; Harada et al., 2008), whereas others do not (Chou & Chi, 2004; Cimarolli & Jopp, 2014; Rudberg, Furner, Dunn, & Cassel, 1993; Wahl et al., 2013). Similarly, Sturrock, Saeed, and Rees (2015) state that ‘for a proportion of people, vision loss does not result in persistent distress or deteriorating mental health outcomes’. Whether an older adult with hearing or vision impairment experiences declining well-being may thus depend on various factors, and our findings suggest that one of these factors may be the use of self-regulatory strategies. Considering all individuals with vision or hearing loss as one homogeneous sample may obscure potential subgroup differences. Therefore, from our point of view, an important future research pathway is to identify subgroups of sensory impaired older adults with regard to well-being and other characteristics, as well as to investigate potential moderators of associations between coping strategies and affective well-being, such as certain resources.

**Study limitations**

This study has several strengths, such as the simultaneous consideration of visually impaired, hearing impaired, and sensory unimpaired older adults with regard to coping efforts or the availability of an extended longitudinal time interval. However, this study also has several limitations. First, our sample was relatively selective, with ‘health constraints’ being one of the main reasons for nonparticipation. This ‘healthy volunteer bias’ (Walsh & Nash, 1978), which is quite common in empirical studies, particularly when sampling (very) old individuals (Vestergaard et al., 2015), may have led to overall high health and possibly well-being levels in our study sample. Moreover, dropout rate at T2 was quite high. However, our selective dropout analyses revealed that only the difference in cognitive abilities between the longitudinal sample and the dropout sample was of large effect size, whereas both samples were not significantly different regarding goal management strategies. Therefore, our findings should not be severely biased because of sample selectivity. Rather, the nonparticipation and attrition of older adults with very low well-being may have resulted in a restricted well-being variability in our sample, so that the ‘true’ associations of well-being with TGP and FGA in the population of older adults might actually be even stronger than the ones we observed in this study.

Second, our study design was limited in that only two measurement occasions were available, which may generally not be sufficient to capture fully the dynamics of late-life changes and of longitudinal associations between different domains (Johnson et al., 2012; Kenny, 2005) and which limited our opportunities for complex longitudinal data analysis, including approaches such as latent growth-curve modeling or longitudinal multilevel regression models. Moreover, the predictive effects of coping modes on subsequent well-being and functional ability might need more time to fully unfold, so that future research based on more measurement occasions and longer study intervals is desirable.

Finally, our sample did not include older adults with dual sensory impairment, i.e. concurrent vision and hearing loss, although dual sensory impairment (or even multisensory impairment; Correia et al., 2016) is rather common in old and very old age (Heine, 2015; Schneider et al., 2011). Given that dual sensory impairment is associated with a higher risk of restrictions in everyday competence (Laforge, Spector, & Sternberg, 1992; Lin et al., 2004) and compromised well-being (Harada et al., 2008; Kiely, Anstey, & Luszcz, 2013) compared to the occurrence of ‘only’ a single sensory impairment, coping strategies may be even more important for maintaining functional ability and well-being when both sensory modes are impaired in late life. Future research should therefore additionally address the role of coping strategies in older adults with dual sensory impairment.
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Disclosure statement

No potential conflict of interest was reported by the authors.

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