Psychosocial Intervention for Age-Related Macular Degeneration: A Pilot Project

Hans-Werner Wahl, Annette Kämmerer, Frank Holz, Daniel Miller, Stefanie Becker, Roman Kaspar, and Ines Himmelsbach

Abstract: This study evaluated an emotion-focused and a problem-focused intervention designed for patients with age-related macular degeneration. It found a limited decrease in depression in the emotion-focused group and an increase in active problem orientation and in adaptation to vision loss in the problem-focused group.

The emotional consequences of age-related vision loss, including reduced levels of well-being and positive affect and greater levels of depression and negative affect, have been reported in the literature (see, for example, Burmedi, Becker, Heyl, Wahl, & Himmelsbach, 2002; Horowitz & Reinhardt, 2000). Longitudinal research has shown that behavioral and emotional adjustment in older adults who are visually impaired (that is, are blind or have low vision) worsens over time (Heyl & Wahl, 2001; Wahl, Schilling, Oswald, & Heyl, 1999). The provision of psychosocial services to older adults to counteract the negative emotional consequences of visual impairment, including age-related macular degeneration (AMD), has been identified as an unmet need in the field of ophthalmological treatment, rehabilitation, and education (Birk et al., 2004; Crews, 2000; Harshbarger, 1980; Horowitz & Reinhardt, 2000). Researchers have found that AMD is associated with significantly lowered functional ability, increased depression, and loss of psychological control (Brody et al., 2001; Rovner, Casten, & Tasman, 2002; Wahl, Becker, Burmedi, & Schilling, 2004).

AMD has become the target of controlled research on psychosocial interventions in the past 10 years. Brody et al.'s (1999) randomized clinical trial of the efficacy of a self-management intervention for elderly patients with AMD, consisting of six weekly two-hour group sessions with 7–10 participants in each group, revealed that the participants experienced significantly reduced psychological distress and greater self-efficacy after the intervention. Brody et al. (2002) repeated and extended their earlier findings by showing that their intervention program resulted in significantly better mood and

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functional ability in the recipients of the intervention than in a control group. The positive effects also held six months after the program ended (Brody, Roch-Levecq, Thomas, Kaplan, & Brown, 2005). The findings of Dahlin-Ivanoff (2000); Dahlin-Ivanoff, Sonn, and Svensson (2002); and Eklund, Sonn, and Dahlin-Ivanoff (2004) underscored the short- and long-term effectiveness of such interventions in improving or maintaining perceived security in daily activities, compared to usual care programs.

Birk et al. (2004) introduced a group intervention similar to the one suggested by Brody et al. (2002) and Dahlin-Ivanoff (2000), with even more emphasis on the principles of cognitive-behavioral therapy (Rybarzcyk, DeMarco, DeLaCruz, Lapidos, & Fortner, 2001). For example, progressive muscle relaxation, a classic means of reducing stress, was paired with training elements aimed at learning how negative thoughts can trigger negative emotions. Training for problem-solving skills was a second major part of the program. The intervention was based on five group sessions distributed over five weeks. A pilot evaluation study, also reported in Birk et al. (2004), provided beginning evidence that this program was able to help participants improve their coping strategies to deal more successfully with vision loss in daily life and to reduce their depressive mood.

The study presented here—continuing the line of research conducted by Birk et al. (2004)—was driven by three related goals. The first goal was to conduct a pilot evaluation of a short psychosocial group intervention, which was limited to three sessions of two to three hours each over three weeks and offered as part of an eye clinic's treatment program. The major reason for such a short intervention program was, in addition to cost-effectiveness, to reduce the transportation burden on attendees (if they could still travel independently) or to their relatives and friends (if they could no longer travel independently). In our earlier study (Birk et al., 2004), a substantial number of patients refused to participate in the five-session group because of the length of the intervention and related logistical problems.

The second goal was to follow an "emotion-focused" approach in one line of intervention and a "problem-focused" approach in another. The major impetus for this two-pronged approach was the classic distinction between emotion-focused versus problem-focused (or "cognitive") coping in research on stress and coping (Filipp, 1999; Folkman & Moskowitz, 2004; Lazarus, 1991). Only a few studies have followed this distinction, and there is empirical evidence that both coping modes are important means of psychosocial adjustment for older adults who are visually impaired (Wahl, 1997). Against this research background, the main purpose of our emotion-focused approach was to further emotion-focused coping, and the major purpose of our problem-focused approach was to develop solutions for the behavioral consequences of AMD in daily life and by this means, cognitive coping efforts (a more in-depth description of our training program is presented in the Intervention program section). Since we wanted to explore the differential effectiveness of major elements of most psychosocial intervention programs and thought that a three-session intervention program would require us to concentrate on one or the other intervention strategy,

we decided not to use a combined strategy of both coping modes in one program.

Our third goal was to explore the long-term effects of the intervention, and toward that end, we included a postintervention follow-up measure two months after the study was completed. On the one hand, the expected short-term gains in the respective outcome measures achieved by both intervention programs could have been maintained in the longer term, thus confirming what other studies have found on the basis of more extensive intervention programs (Brody et al., 2005; Eklund et al., 2004). On the other hand, a three-session training program may have been insufficient to perpetuate the possible short-term gains over several months. If an intervention that is too short leaves too many unresolved issues, it may result in either the loss of gains from training or more detrimental effects, such as unfulfilled hopes, which may eventually lead to frustration and disappointment.

With this backdrop, we formulated the following hypotheses. First, we hypothesized that the different interventions would lead to differential outcomes. In line with a classic insight of research on training—that effects can be found mainly in the performance aspects of a training procedure (see Baltes & Willis, 1982)—we expected that gains that were due to the emotion-focused approach should be detected predominantly as a decrease in negative emotion-related target concepts, such as depression, and gains that were due to the problem-focused approach would be manifest in the perceived ability to deal better with problems of daily living. Second, we expected a gain in general adjustment from both the emotion-focused and the problem-focused approaches that should be echoed in measures, such as Adaptation to Vision Loss (Horowitz & Reinhardt, 1998). We did not extend these hypotheses to the two-month follow-up assessment because there were reasons for and against the expectation that positive effects would be preserved.

Method

Research design and sample

The research design was a pretest–posttest standardized assessment of two intervention groups and a group without treatment. All the participants who were in the treatment group were outpatients at the Department of Ophthalmology at the University of Heidelberg, Germany, where the intervention programs were conducted. All the patients fulfilled the inclusion criterion of a diagnosis of AMD by the ophthalmologists who were involved in the study; their remaining visual acuity in the better eye had to be less than 20/50, representing a substantial loss in day-to-day functioning and reading ability. In addition, they were all older than age 60 and were living in private households. Patients with severe terminal illnesses, major hearing loss (not corrected or correctable by a hearing aid), and major cognitive impairment, as documented in their medical files, were excluded from the study. The sampling goal was of at least 20 patients in each treatment group, to allow for the detection of at least "medium" effects at the .05 level of significance with a test power of 80% (Bortz & Döring, 1995; Cohen, 1988).

A description of the participants is presented in Table 1. Participants with lower levels of education were represented more frequently in both intervention groups, married participants were less frequent in the comparison group, and those with

Table 1
Description of the sample at the preassessment.

Variable (at premeasurement)	Emotion-focused group (n = 23)	Problem-focused group (n = 22)	Comparison group (n = 22)
Mean age (in years; *SD*, range in parentheses)	76.5 (6.8, 65–92)	76.6 (7.1, 61–88)	77.3 (6.4, 64–84)
Gender: female (percent)	90	68	77
Education: Elementary school only (percent)	39	50	59
Civil status: Married (percent)	52	64	27
Duration of vision loss: More than one year (percent)	43	29	48

a long (more than one year) duration of vision loss were less frequent in the problem-focused group. These differences did not, however, reveal any consistent tendency toward a positive or negative selection for any group.

To attain the sampling goal, a total of 76 patients with AMD were asked to participate in the treatment groups. Of the 76, 58 agreed to participate and signed a written informed-consent form after they received detailed information on the purpose and procedures of the study. These patients were randomly assigned to one kind of intervention (emotion focused versus problem focused).

The nontreatment group, which also fulfilled all the relevant inclusion criteria described earlier, was selected from a list of outpatients with AMD that was provided by the eye clinic of the University of Mannheim, Germany. We recruited the nontreatment group this way because the study's resources did not allow for a waiting-list control group. Because of this limitation and the concomitant limitation of an incomplete randomized assignment to all the groups from the same population of patients, we use the term *comparison group*, rather than *control group.* Of the 35 patients who were asked to participate in the comparison group, 24 gave their written informed consent after they received detailed information on the study's purpose and procedures.

Of the 82 persons (58 from the intervention groups and 24 from the comparison group) who agreed to participate in the study, some did not show up at the training site, some did not attend the full set of three psychosocial training sessions, and others could not be convinced to participate in the postassessment; thus, a total of 15 individuals dropped out, 13 who were originally assigned to the intervention groups and 2 who were originally assigned to the comparison group. Regarding the differences between the 15 dropouts and the 67 pre–poststudy participants (23 in the emotion-focused group, 22 in the problem-focused group, and 22 in the comparison group), the overall psychosocial adaptation of the participants tended to be better than that of the dropouts, a problem that is often seen in intervention research (Schulz, Maddox, & Lawton, 1998).

As expected, the sample sizes further decreased between the end of the study and the two-month follow-up. That is, the emotion-focused group was reduced from 23 to 21 participants, the problem-focused group was reduced from 22 to 17 participants, and the comparison group was reduced from 22 to 16 participants. No statistically significant differences

with respect to the sociostructural and health-related variables or to depression and adaptation to vision loss were found between the 54 who remained in the study and the 13 who did not participate in the follow-up.

The intervention program

The basis of the three-session psychosocial group intervention was the program developed by Birk et al. (2004), which was designed for five group sessions across five weeks. In line with the empirical intervention research on older adults who are visually impaired (Birk et al., 2004; Brody et al., 2002; Dahlin-Ivanoff, 2000), one fundamental assumption was that a group approach is helpful to promote positive change in elderly persons with AMD (see also Harshbarger, 1980). Group settings tend to stimulate, for example, vicarious learning experiences, and simply sharing similar experiences related to vision loss with others can be a great relief. Another fundamental assumption was that three sessions offered across three weeks may be an intervention that is intense enough to have a positive impact on older persons with AMD, given that a focused approach on either negative emotions related to the experience of AMD or on coping with everyday problems related to AMD is followed. Still another, third, fundamental assumption, in line with the literature on both general group training and group therapy (see, for example, Rybarczyk et al., 2001), as well as evidence from previous intervention programs with persons with AMD (Birk et al., 2004; Brody et al., 2002; Dahlin-Ivanoff, 2000), was that both strategies have a unique potential to improve the psychosocial situation of persons with AMD.

The primary goal of the emotion-focused intervention was to help the participants learn to deal with negative and cumbersome emotions related to the day-to-day experience of loss caused by AMD by talking about them in a group context. The participants were encouraged to do so by the creation of a warm group atmosphere and the stimulation of emotional expression by a pair of group trainers. In addition, a practically framed "emotion change theory" was offered to communicate the message that negative and positive emotions are strongly triggered by cognitive beliefs and situational evaluations (such as "My life is worthless now with such vision loss") and that changing these cognitions can lead to better emotional adaptation. Moreover, all kinds of positive experiences in the lives of the participants were highlighted, and training was offered, so the participants could actively seek and create everyday life situations that evoke a maximum of positive emotions. The participants were given homework to help carry over the principles of "emotion change theory" to their everyday lives.

The primary goal of the problem-focused intervention was for the participants to deal with all kinds of daily problems caused by AMD in a strongly "I can make it" manner. Emphasis was placed on discussing common problems of daily living, which was again encouraged by the creation of a warm group atmosphere and the stimulation of such emotional reports by the group trainers. In addition, a practically framed "problem change theory" was offered to communicate the message that labeling problems as unsolvable is frequently unjustified and an overgeneralization (for instance, "I can no longer han-

dle my life"), whereas a detailed problem analysis and the implementation of achievable goals can lead to better adaptation. Multiple strategies to find such solutions, albeit by unusual means, such as changing one's home environment, using one's other senses, or changing the "normal" routine of activities, were explored. The goal was to work successfully on at least one real and meaningful problem across the three sessions. Again, homework was given to encourage the translation of the principles of problem change theory into the participants' day-to-day lives.

Similar to the precursor study (Birk et al., 2004), a clinical setting—the Department of Ophthalmology of the University of Heidelberg—was chosen as the site of both intervention groups. Two group trainers with a background in clinical psychology ran each group because we expected that a dense psychosocial intervention across three sessions would likely profit from such teamwork. We found that the optimal size of each group ranged from a minimum of three to a maximum of six persons.

Outcome measures

With respect to emotional adaptation, we used the 15-item short version of the Geriatric Depression Scale (GDS; Sheik & Yesavage, 1986) with a required yes-or-no answer on each item and higher scale scores indicating more severe depressive states. The theoretical range is thus between 0 and 15 points. Internal consistency of the GDS typically is generally high and reached a Cronbach's alpha of .82 in the present study for the entire sample of 67 at the preassessment.

To address the participants' problem orientation, we used the subscale Active Problem Orientation from the Freiburger Fragebogen zur Krankheitsbewältigung (Frieburg Inventory on Coping with Illness), a standard German psychodiagnostic instrument to assess styles of coping with illness (Muthny, 1989). This five-item measure addresses illness-related behaviors, such as seeking information on diseases and treatments or making plans to cope proactively with illnesses. Each item is rated on 5-point Likert-type scale, from 1 ("not at all") to 5 ("very strong"), leading to a theoretical range of 1 to 25 points. Higher scores indicate a higher active problem orientation. The internal consistency of the Active Problem Orientation subscale reached a Cronbach's alpha of .75 in the present study for the entire sample of 67 at the preassessment.

With respect to adjustment at large, we applied a German version of the Adaptation to Vision Loss Scale (AVL; Horowitz & Reinhardt, 1998) to assess the extent to which a person accepts vision loss in a realistic manner. A sample item is "Because of my vision loss, I feel that I can never really do things for myself." We used a shortened version of the original scale proposed by Horowitz and Reinhardt (2001, personal communication) consisting of 14 items to be answered on a 4-point scale, from 0 ("strongly agree") to 3 ("strongly disagree"), leading to a theoretical range of between 0 and 42 points, with higher scores indicating higher adaptation. The Cronbach's alpha of this shortened version of the AVL reached .74 in the present study, while Horowitz and Reinhardt (1998) reported a Cronbach's alpha of .84 for the original version consisting of 33 items.

All the assessments in the study were performed as telephone interviews by

trained research assistants who were not informed about the research status of those they interviewed. The mean period between the pre- and postassessment was 39.5 days (*SD* = 12.8), and the mean period between postassessment and the two-month follow-up was 58.2 days (*SD* = 17.8). The mean duration of the assessment was approximately 20 minutes.

Data analysis

Because the generation of a separate comparison group was not the result of randomization and those who dropped out had been assigned to a treatment condition, we expected to find group differences at Time 1 (T1—preassessment) with possible consequences for Time 2 (T2—postassessment). Therefore, we conducted analyses of variance (ANOVAs) based on the change scores for each of the three outcome measures, with the respective outcome level at T1 controlled simultaneously as a covariate (ANCOVA). ANCOVAs were run for T1–T2 comparisons, as well as for the comparison of T1 with the two-month postassessment (Time 3, or T3). In addition to conventional significance testing, we calculated effect sizes based on Cohen's (1988, p. 407) recommendations for ANOVA designs and expressed them in percentages. A unique determination value of at least 2% of the overall outcome variance is regarded as the threshold for a small effect, 13% for a medium effect, and 26% for a large effect.

Results

Table 2 depicts the findings of all three outcome measures. Means and standard deviations are shown at T1 and T2. Table 2 also gives the mean difference scores of T1 and T2. It should be noted that these

Table 2
T1–T2 assessments regarding outcome measures.

Outcome measure, by group[a]	*M* (*SD* in parentheses) T1	T2	Difference T2-T1[b]	*p*-values[c]	Effect size (percent)[d]
Depression				$p = .047$	2.7
EmG	3.5 (2.8)	2.9 (2.2)	–0.55		
PrG	4.1 (3.8)	4.1 (4.0)	0.15		
CG	3.7 (3.1)	3.6 (3.2)	–0.06		
Active problem orientation				$p = .000$	15.9
EmG	15.1 (4.6)	13.7 (4.5)	–0.39		
PrG	12.4 (4.9)	14.6 (5.4)	2.14		
CG	10.0 (4.5)	9.5 (3.5)	–1.56		
Adaptation to vision loss				$p = .002$	11.1
EmG	25.9 (6.9)	25.8 (6.8)	0.18		
PrG	22.4 (6.1)	26.4 (8.3)	3.51		
CG	25.6 (6.6)	24.7 (6.1)	–0.64		

[a]EmG = emotion-focused group ($n = 23$), PrG = problem-focused group ($n = 22$), and CG = comparison group ($n = 22$).
[b] Difference scores were corrected for potential differences of the respective outcome variables at the T1 assessment.
[c]ANCOVA of intervention group effects on T1–T2 differences, controlled for T1-levels.
[d]Effect size calculation for the ANCOVA designs according to Cohen (1988, p. 407); 2% = small effect, 13% = medium effect, and 26% = large effect.
* $p <$ .05, ** $p <$ .01.

difference scores are estimations that account for different group levels at the preassessment. Furthermore, the result of the ANCOVA in terms of the statistical significance of the unique design-group-effect (after the T1 level was statistically controlled as a covariate), as well as the respective effect sizes, are reported.

As can be seen, the depression scores were, as expected, lower at T2, particularly in the emotion-focused group. In addition, the mean change scores were the highest for this group. Although this effect was statistically significant, $F(2,63) = 2.81$, $p = .047$, the respective effect size revealed only a small effect (2.7%). It should be noted here that the depression level was already low at T1 in both intervention groups, making it difficult to reduce further the participants' average depression level. Taking the suggested cutoff of 5 as an indication of clinically relevant depression in the GDS (Sheik & Yesavage, 1986), we found that three participants in the emotion-focused group, compared to two participants in the problem-focused group, switched from over to under this threshold between T1 and T2. In the comparison group, this was the case for one participant. In sum, the effect in terms of depression was in the theoretically expected direction, but it was relatively weak.

In accordance with our hypotheses, the participants' active problem orientation increased, particularly in the problem-focused group. Also, the effect size pointed to a medium effect in this case, $F(2,62) = 10.08$, $p = .000$ (15.9%) That is, the effect observed with respect to active problem solving was substantial even after the differences in this variable were controlled at T1.

The expected increase in both intervention groups in adaptation to vision loss was only partially confirmed. A significant increase was observed only in the problem-focused group, with an effect size indicating a small effect, $F(2,62) = 5.72$, $p = .002$ (11.1%), not far from the threshold for a medium effect (13%).

With regard to the comparison of the preassessment status of the groups with their two-month follow-up status, a remarkable effect appeared, particularly in the case of depression. As can be seen in Table 3, depression increased in the problem-focused group between T1 and T3, with a medium-sized overall intervention-group effect, $F(2,50) = 3.52$, $p = .037$ (12.3%). In addition, active problem orientation decreased somewhat in the emotion-focused group, but more strongly in the problem-focused group and in the comparison group. However, this change was not significant and was small in terms of effect size, $F(2,49) = 0.93$, $p = .403$ (3.7%). Finally, change with respect to adaptation to vision loss was no longer observable; that is, no statistical significance appeared, and the effect size was below the 2% threshold (0.9%) indicating no effect, $F(2,49) = .22$, $p = .799$.

Discussion

A body of research has demonstrated that the psychosocial needs of elderly persons who are visually impaired, particularly those with AMD, are substantial (see Brody et al., 2001; Burmedi et al., 2002; Horowitz & Reinhardt, 2000; Wahl et al., 2004). These needs are, however, largely unmet in ophthalmological treatment regimes. The major goal of this study was to expand previous psychosocial intervention programs for persons with AMD by

Table 3
T1–T3 (two-month follow-up) assessment regarding the outcome measures.

Outcome measure, by group[a]	*M* (*SD* in parentheses)		Difference T3–T1	*p*-values	Effect size (percent)
	T1	T3			
Depression				.037	12.3
EmG	3.2 (2.4)	3.2 (2.0)	–0.04		
PrG	4.1 (3.6)	5.3 (4.4)	1.36		
CG	3.2 (2.6)	2.9 (2.7)	–0.33		
Active problem orientation				.403	3.7
EmG	15.3 (4.8)	13.5 (3.6)	–0.46		
PrG	14.1 (4.8)	11.6 (4.9)	–1.98		
CG	9.7 (4.9)	9.8 (4.3)	–2.16		
Adaptation to vision loss				.799	0.9
EmG	25.7 (6.6)	26.4 (5.6)	0.78		
PrG	22.9 (6.1)	24.2 (6.9)	0.40		
CG	27.1 (5.9)	28.2 (8.1)	1.69		

[a]EmG = emotion-focused group (*n* = 21), PrG = problem-focused group (*n* = 17), and CG = comparison group (*n* = 16); see the notes for Table 2 for additional explanations.

testing the effects of a short psychosocial intervention based on only three group sessions distributed across three weeks.

The study provided some empirical evidence for our hypotheses of the differential effectiveness of two major components that are typically included in such programs: A positive intervention effect (concerning an increase in an active problem orientation) from the pre- to the postassessment was observed only in the problem-focused group, and a decrease, although weak, in depression was observed only in the emotion-focused group. One possible reason for the small decrease in depression may be that the average depression status of both intervention groups at T1 was already low, which may have been a result of the observed positive selection effects. The expected overall increase in adaptation to vision loss was found only in the problem-focused group. Thus, our findings coincide, in general, with the positive effects reported in other studies with regard to self-management programs, which were similar to the problem-focused approach of this study (Birk et al., 2004; Brody et al., 2002, 2005; Dahlin-Ivanoff, 2000; Dahlin-Ivanoff et al., 2002; Eklund et al., 2004). In sum, our T1–T2 effects were generally weaker than those reported in the other studies. The major explanation for this finding is probably the lower dose of psychosocial intervention provided in only three sessions in our study, compared to the 6–10 sessions in the other studies (Brody et al. 2002; Dahlin-Ivanoff, 2000).

Additional findings of this study underline that there may also be substantial qualitative differences in short versus longer psychosocial group interventions. As we found, not only did the positive effects of active problem orientation and adaptation to vision loss disappear from the pre- to the two-month follow-up assessment, but depression increased substantially in the problem-focused intervention group. Of course, these findings need to be interpreted with caution because of the small samples. It seems, however, that the problem-focused intervention, with its "I

can make it" impetus, may have raised the hope that it is possible to solve one's psychosocial problems related to AMD in a short period of time. But if this initial stimulation is not continuously supported after the intervention sessions, frustration and disappointment may result. It is important to note that long-term evaluations, such as Brody et al.'s (2005) six-month evaluation, have found promising effects in the longer term, which supports the need to have at least six sessions to make it more likely that the positive effects will be sustained.

The combined interpretation of the T1–T2 and T1–T3 findings leads us to conclude that short psychosocial interventions programs for persons with AMD are insufficient. Instead, on the basis of earlier intervention research (such as Birk et al., 2004; Brody et al., 2002; Dahlin-Ivanoff, 2000; Eklund et al., 2004), at least six group sessions seem necessary to provide sustainable gains in psychosocial outcomes. Furthermore, a mix of psychosocial elements that address both behavioral and emotion-oriented strategies, such as the one suggested by Birk et al. (2004), may be the most effective in eliciting problem-solving as well as emotion-related improvement in the quality of life of persons with AMD.

The limitations of our study in terms of the rigor of the design and the sample sizes are obvious. In particular, it was not possible to assign participants to treatment and control groups in a strictly random manner, and thus caution is necessary regarding the generalizability of our findings to all persons with AMD. However, we believe that our study provides additional evidence that can be used to plan future intervention research with at least six group training sessions. We also believe, after the practical experiences of our study, as well as the results of other studies (such as Brody et al., 2002), that it is economically feasible to use only one trainer per group, rather than the two that were used in our study.

In conclusion, there is still a great need for additional outcome studies (both short- and long-term) of psychosocial interventions with older adults who are visually impaired that include measures of cost-effectiveness, to improve the evidence for such investments. On a more practical level, psychosocial interventions provide an important addition to traditional low vision rehabilitation programs and may even enhance their effectiveness.

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Hans-Werner Wahl, Ph.D., *chair, Department of Psychological Aging Research, Institute of Psychology, University of Heidelberg, Bergheimer Straße 20, 69115 Heidelberg, Germany; e-mail: <wahl@dzfa.uni-heidelberg.de>.* ***Annette Kämmerer, Ph.D.,*** *Department of Clinical Psychology, Institute of Psychology, University of Heidelberg, Hauptstraße 47–51, 69117 Heidelberg, Germany; e-mail: <annette.kaemmerer@psychologie.uni-heidelberg.de>.* ***Frank Holz, Ph.D.,*** *professor and director, Ophthalmic Clinic, Department of Ophthalmology, University of Bonn, Ernst-Abbe-Straße 2, D-53127, Bonn, Germany; e-mail: <frank.holz@ukb.uni-bonn.de>.* ***Daniel Miller, Ph.D.,*** *Department of Ophthalmology, University of Heidelberg, Im Neuenheimer Feld 400, 69120, Heidelberg, Germany; e-mail: <daniel_miller@med.uni-heidelberg.de>.* ***Stefanie Becker, Ph.D.,*** *Institute of Gerontology, University of Heidelberg; e-mail: <stefanie.becker@urz.uni-heidelberg.de>.* ***Roman Kaspar, M.A.,*** *research assistant, Institute of Gerontology, University of Heidelberg; e-mail: <kaspar@dzfa.uni-heidelberg.de>.* ***Ines Himmelsbach, M.A.,*** *University of Frankfurt, Robert-Mayer-Strasse 1, 60054, Frankfurt, Germany; e-mail: <himmelsbach@em.uni-frankfurt.de>.*

