

Supplementary material to Bettchart, Wolf, Herrmann, & Brandstätter***Age-Related Development of Self-Regulation:******Evidence on Stability and Change in Action Orientation*****Study 1****Items and Factor Loadings of ACS-90**

Items of ACS-90. All items and the answers of the two subscales of the ACS-90 (Kuhl, 1994) are presented in Table S1 for AOF and Table S2 for AOP.

Factor loadings. A principal component analysis was conducted in order to examine factor loadings in each subscale. Factor loadings for women and men over all measurement times are presented in Table S3 (separate models by gender). Factor loadings for the three age groups over all measurement times are presented in Table S4 for women and in Table S5 for men. As the tables indicate, low factor loadings largely coincide with exclusion from our adjusted scale.

Measurement Invariance Testing

Model Fit Indices and Comparisons Between Genders and Age Groups. Model fit indices and comparisons between genders and age groups for T2 to T5 are presented in Table S6.

Table S1

Items of the Subscale AOF of the ACS-90 (Kuhl, 1994)

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1. **When I have lost something that is very valuable to me and I can't find it anywhere:**
 - a) I have a hard time concentrating on something else
 - b) I put it out of my mind after a little while*
 2. **If I've worked for weeks on one project and then everything goes completely wrong with the project:**
 - a) It takes me a long time to adjust myself to it
 - b) It bothers me for a while, but then I don't think about it anymore*
 3. When I'm in a competition and have lost every time:
 - a) I can soon put losing out of my mind*
 - b) The thought that I lost keeps running through my mind
 4. **If I had just bought a new piece of equipment (for example, a tape deck) and it accidentally fell on the floor and was damaged beyond repair:**
 - a) I would manage to get over it quickly*
 - b) It would take me a long time to get over it
 5. If I have to talk to someone about something important and, repeatedly, can't find her/him at home:
 - a) I can't stop thinking about it, even while I'm doing something else
 - b) I easily forget about it until I see the person*
 6. When I've bought a lot of stuff at a store and realize when I get home that I paid too much – but I can't get my money back:
 - a) I can't concentrate on anything else
 - b) I easily forget about it*
 7. **When I am told that my work has been completely unsatisfactory:**
 - a) I don't let it bother me for too long*
 - b) I feel paralyzed
 8. **If I'm stuck in traffic and miss an important appointment:**
 - a) At first, it's difficult for me to start do anything else at all
 - b) I quickly forget about it and do something else*
 9. **When something is very important to me, but I can't seem to get it right:**
 - a) I gradually lose heart
 - b) I just forget about it and do something else*
 10. When something really gets me down:
 - a) I have trouble doing anything at all
 - b) I find it easy to distract myself by doing other things*
 11. **When several things go wrong on the same day:**
 - a) I usually don't know how to deal with it
 - b) I just keep on going as though nothing had happened*
 12. **When I have put all my effort into doing a really good job on something and the whole thing doesn't work out:**
 - a) I don't have too much difficulty starting something else*
 - b) I have trouble doing anything else at all
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Note. Action-oriented answers are marked with an asterisk (*). Items in bold are included in adjusted scales.

Table S2

Items of the Subscale AOP of the ACS-90 (Kuhl, 1994)

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1. **When I know I must finish something soon:**
 - a) **I have to push myself to get started**
 - b) **I find it easy to get it done and over with***
 2. When I don't have anything in particular to do and I am getting bored:
 - a) I have trouble getting up enough energy to do anything at all
 - b) I quickly find something to do*
 3. **When I am getting ready to tackle a difficult problem:**
 - a) **It feels like I am facing a big mountain that I don't think I can climb**
 - b) **I look for a way that the problem can be approached in a suitable manner***
 4. **When I have to solve a difficult problem:**
 - a) **I usually don't have a problem getting started on it***
 - b) **I have trouble sorting things out in my head so that I can get down to working on the problem**
 5. When I have to make up my mind about what I am going to do when I get some unexpected free time:
 - a) It takes me a long time to decide what I should do during this free time
 - b) I can usually decide on something to do without having to think it over very much*
 6. **When I have work to do at home:**
 - a) **It is often hard for me to get the work done**
 - b) **I usually get it done right away***
 7. **When I have a lot of important things to do and they must all be done soon:**
 - a) **I often don't know where to begin**
 - b) **I find it easy to make a plan and stick with it***
 8. When there are two things that I really want to do, but I can't do both of them:
 - a) I quickly begin one thing and forget about the other thing I couldn't do*
 - b) It's not easy for me to put the other thing I couldn't do out of my mind
 9. **When I have to take care of something important which is also unpleasant:**
 - a) **I do it and get it over with***
 - b) **It can take a while before I can bring myself to do it**
 10. **When I am facing a big project that has to be done:**
 - a) **I often spend too long thinking about where I should begin**
 - b) **I don't have any problems getting started***
 11. When I have a boring assignment:
 - a) I usually don't have any problem getting through it*
 - b) I sometimes can't get moving on it
 12. **When I have an obligation to do something that is boring and uninteresting:**
 - a) **I do it and get it over with***
 - b) **It can take a while before I can bring myself to do it**
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Note. Action-oriented answers are marked with an asterisk (*). Items in bold are included in adjusted scales.

Table S3

Factor Loadings of AOF and AOP for Women and Men in Study 1 (Separate Models per Gender)

	Women					Men				
	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
AOF										
Item 1	.477	.427	.665	.645	.638	.645	.668	.639	.712	.761
Item 2	.742	.758	.837	.785	.686	.809	.569	.676	.839	.827
Item 3*	.474	.654	.512	.505	.479	.381	.451	.537	.424	.564
Item 4	.688	.624	.761	.663	.704	.709	.748	.560	.735	.752
Item 5*	.315	.455	.443	.437	.428	.348	.504	.457	.404	.410
Item 6*	.603	.576	.698	.730	.552	.674	.479	.509	.496	.432
Item 7	.640	.738	.628	.661	.707	.734	.665	.728	.647	.775
Item 8	.720	.686	.752	.656	.764	.673	.752	.797	.587	.705
Item 9	.575	.526	.725	.583	.676	.656	.849	.620	.725	.773
Item 10*	.635	.535	.706	.619	.589	.449	.393	.591	.447	.652
Item 11	.633	.702	.599	.711	.704	.694	.553	.627	.787	.706
Item 12	.729	.780	.906	.834	.834	.896	.877	.793	.841	.816
AOP										
Item 1	.774	.746	.660	.752	.753	.690	.810	.815	.796	.849
Item 2*	.439	.419	.447	.499	.463	.610	.638	.631	.647	.713
Item 3	.725	.611	.581	.700	.692	.770	.726	.713	.715	.779
Item 4	.672	.717	.766	.812	.604	.745	.797	.803	.786	.725
Item 5*	.427	.472	.595	.542	.673	.466	.593	.674	.428	.646
Item 6	.705	.475	.642	.618	.541	.607	.730	.543	.618	.710
Item 7	.569	.619	.644	.630	.640	.645	.711	.854	.692	.824
Item 8*	.598	.580	.464	.545	.530	.437	.528	.455	.528	.414
Item 9	.699	.648	.710	.791	.719	.713	.735	.779	.792	.711
Item 10	.655	.698	.768	.722	.846	.778	.862	.854	.865	.847
Item 11*	.376	.494	.492	.512	.584	.582	.640	.519	.641	.716
Item 12	.659	.744	.761	.792	.776	.658	.680	.711	.665	.817

Note. Factor loadings > .7 are in bold, factor loadings < .5 are in italics. T (in T1, T2 etc.) = measurement time. * = items not included in adjusted scales.

Table S4

Factor Loadings of AOF and AOP for the Three Age Groups for Women in Study 1

	Age Group 1					Age Group 2					Age Group 3				
	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
AOF															
Item 1	.399	.348	.533	.800	.714	.457	.518	.574	.659	.584	.555	.475	.780	.572	.768
Item 2	.824	.754	.808	.860	.758	.480	.645	.699	.632	.717	.911	.866	.958	.962	.629
Item 3*	.253	.429	.738	.365	.698	.497	.687	.386	.525	.526	.625	.771	.537	.613	.420
Item 4	.631	.573	.814	.477	.667	.702	.668	.617	.576	.685	.882	.773	.908	.937	.818
Item 5*	.410	.549	.355	.200	.549	.065	.485	.664	.556	.475	.516	.481	.354	.483	.335
Item 6*	.420	.388	.489	.464	.665	.602	.797	.776	.787	.867	.832	.648	.843	.902	.529
Item 7	.495	.637	.788	.639	.689	.328	.499	.166	.309	.461	.884	.928	.816	.887	.864
Item 8	.757	.543	.841	.523	.865	.635	.622	.664	.516	.542	.839	.881	.900	.904	.955
Item 9	.347	.140	.660	.559	.539	.602	.483	.697	.443	.676	.749	.785	.784	.692	.774
Item 10*	.575	.519	.649	.618	.458	.415	.470	.504	.567	.621	.804	.727	.955	.767	.728
Item 11	.587	.776	.605	.623	.370	.679	.597	.285	.590	.699	.804	.861	.809	.883	.880
Item 12	1.004	.761	.907	.766	.881	.455	.625	.768	.883	.709	.854	.928	1.020	.885	.921
AOP															
Item 1	.865	.847	.655	.730	.731	.758	.772	.651	.913	.922	.863	.790	.853	.756	.838
Item 2*	.668	.743	.186	.521	.581	.195	-.197	.336	.395	.408	.580	.763	.587	.683	.502
Item 3	.508	.290	.232	.479	.642	.783	.614	.554	.577	.657	.851	.892	.772	.975	.869
Item 4	.639	.894	.771	.843	.666	.744	.531	.816	.732	.653	.813	.880	.873	.963	.657
Item 5*	.195	.056	.188	.373	.580	.329	.075	.557	.634	.504	.624	.844	.764	.528	.860
Item 6	.756	.399	.576	.576	.642	.598	.565	.635	.541	.275	.861	.471	.804	.826	.749
Item 7	.583	.553	.554	.792	.449	.630	.581	.645	.599	.714	.708	.793	.767	.709	.738
Item 8*	.296	.227	-.124	-.056	.198	.508	.470	.313	.506	.341	.698	.691	.704	.734	.730
Item 9	.721	.444	.518	.753	.854	.519	.601	.676	.778	.716	.948	.939	.919	.893	.823
Item 10	.666	.457	.404	.627	.638	.514	.625	.756	.732	.838	.849	.944	.951	.790	.924
Item 11*	.419	.482	.337	.533	.414	.123	.037	.138	.086	.428	.578	.821	.783	.894	.811
Item 12	.609	.318	.674	.673	.613	.461	.751	.690	.856	.713	.913	.961	.979	.838	.962

Note. Factor loadings > .7 are in bold, factor loadings < .5 are in italics. T (in T1, T2 etc.) = measurement time. * = items not included in adjusted scales.

Table S5

Factor Loadings of AOF and AOP for the Three Age Groups for Men in Study 1

	Age Group 1					Age Group 2					Age Group 3				
	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
AOF															
Item 1	.645	.798	.693	.908	.633	.683	<i>.478</i>	.605	.724	.669	.708	.803	.731	.700	.942
Item 2	.860	.802	.836	.939	.816	.736	<i>.441</i>	<i>.498</i>	.709	.793	.877	.628	.824	.931	.883
Item 3*	<i>-.035</i>	<i>-.053</i>	<i>.307</i>	<i>.199</i>	<i>.625</i>	.713	<i>.498</i>	<i>.570</i>	<i>.427</i>	<i>.480</i>	<i>.284</i>	.723	.704	.549	.557
Item 4	.808	.782	.594	.730	.865	.788	.652	.506	.771	.608	.547	.871	.746	.778	.930
Item 5*	<i>-.070</i>	<i>.115</i>	<i>.245</i>	<i>.271</i>	<i>.313</i>	<i>.473</i>	<i>.547</i>	<i>.648</i>	<i>.495</i>	<i>.569</i>	.551	.666	.542	<i>.466</i>	<i>.343</i>
Item 6*	.511	<i>.092</i>	<i>.105</i>	<i>.154</i>	<i>.097</i>	.886	<i>.677</i>	.783	.623	.743	.644	.588	.533	.700	.541
Item 7	.668	.694	.627	.773	.533	.701	.622	.709	.561	.744	.786	.658	.795	.585	.875
Item 8	.505	.694	.818	<i>.448</i>	.684	.720	.690	.767	.707	.536	.756	.897	.939	.608	.959
Item 9	.676	.750	.613	.736	.673	.601	.875	.574	.612	.833	.702	.942	.659	.825	.792
Item 10*	.553	.549	.657	<i>.320</i>	.810	<i>.437</i>	<i>.238</i>	.673	<i>.423</i>	.575	<i>.402</i>	<i>.445</i>	.598	.714	.801
Item 11	.847	.595	.704	.796	.680	.603	<i>.431</i>	<i>.483</i>	.671	.687	.665	.621	.717	.889	.785
Item 12	.876	.706	.957	.849	.752	.894	.852	.620	.754	.731	.972	1.039	.834	.942	.910
AOP															
Item 1	.827	.917	.705	.889	.804	<i>.405</i>	<i>.579</i>	.789	.553	.760	.890	.915	.924	.922	.947
Item 2*	.730	.828	.862	.789	.782	<i>.408</i>	<i>.559</i>	<i>.311</i>	<i>.475</i>	.693	.730	.524	.815	.884	.757
Item 3	.736	.774	.821	.845	.940	.824	.707	.598	.831	.768	.819	.796	.812	<i>.403</i>	<i>.575</i>
Item 4	.741	.824	.869	.863	.747	.749	.578	.623	.707	.703	.787	.927	.933	.882	.795
Item 5*	<i>.444</i>	.510	.729	.770	.515	.582	.524	.501	<i>.241</i>	.536	<i>.385</i>	.791	.913	.560	.930
Item 6	.685	.735	.576	.665	.807	<i>.315</i>	.621	<i>.418</i>	<i>.425</i>	.546	.827	.800	.592	.733	.796
Item 7	.689	.874	.903	.692	.848	<i>.755</i>	<i>.485</i>	.864	.753	.989	.515	.784	.791	.686	.737
Item 8*	<i>.088</i>	.510	<i>.458</i>	<i>.499</i>	<i>-.172</i>	.599	.674	.548	.578	.572	.549	<i>.483</i>	.525	.604	.724
Item 9	.878	.896	.853	.959	.660	.532	.329	.596	.553	.572	.689	.916	.897	.825	.919
Item 10	.877	.840	.927	.826	.860	.703	.870	.729	.934	.784	.808	.878	.943	.810	.916
Item 11*	.617	.532	.742	.696	.666	<i>.406</i>	.622	<i>.204</i>	<i>.348</i>	.519	.768	.701	.606	.836	1.047
Item 12	.766	.681	.800	.830	.815	<i>.342</i>	.540	<i>.438</i>	.796	.801	.764	.838	.699	.893	

Note. Factor loadings > .7 are in bold, factor loadings < .5 are in italics. T (in T1, T2 etc.) = measurement time. * = items not included in adjusted scales.

Table S6

Model Comparison to Test for Measurement Invariance Between Genders and Age Groups at T2 to T5 in Study 1

	χ^2	<i>df</i>	<i>P</i>	<i>CFI</i>	<i>TLI</i>	<i>RMSEA</i>	<i>SRMR</i>
T2							
Configural model	1317.7	1326	0.559	1.000	1.001	0.000	0.144
Scalar model	1413.9	1386	0.295	0.996	0.996	0.015	0.144
Residual model	1624.5	1466	0.002	0.978	0.977	0.034	0.151
T3							
Configural model	1380.8	1326	0.144	0.993	0.993	0.023	0.159
Scalar model	1471.8	1386	0.054	0.990	0.989	0.028	0.16
Residual model	1616.4	1466	0.003	0.982	0.982	0.036	0.165
T4							
Configural model	1284.7	1326	0.787	1.000	1.006	0.000	0.159
Scalar model	1380.4	1386	0.537	1.000	1.001	0.000	0.160
Residual model	1618.3	1466	0.003	0.981	0.980	0.038	0.170
T5							
Configural model	1264.0	1326	0.887	1.000	1.009	0.000	0.160
Scalar model	1343.9	1386	0.787	1.000	1.006	0.000	0.160
Residual model	1559.1	1466	0.045	0.988	0.988	0.030	0.169

Note. Robust diagonally weighted least squares (DWLS) were used as estimator. CFI = Comparative Fit Index. TLI = Tucker-Lewis Index. RMSEA = Root Mean Square Error of Approximation. SRMR = Standardized Root Mean Square Residual.

Cross-Sectional Analyses

We calculated t-tests to analyze mean differences in AOF and AOP between young and old adults for women and men at all measurement times (see Figure 1 for a graphical display of mean differences at T1).

For women, there were statistically significant (Bonferroni-corrected) differences in AOF between young and old adults at T1, $t(227) = 3.749$, $p < .001$, $d = .49$, and at T5, $t(126) = 3.046$, $p = .003$, $d = .52$. For AOP, there were no statistically significant (Bonferroni-corrected) differences between young and old adults.

For men, there were statistically significant (Bonferroni-corrected) differences in AOF between young and old adults at T1, $t(234) = 3.061$, $p = .002$, $d = .40$, at T2, $t(183) =$

3.914, $p < .001$, $d = .57$, and at T4, $t(131) = 2.658$, $p = .009$, $d = .46$. For AOP, there were statistically significant (Bonferroni-corrected) differences between young and old adults at T1, $t(235) = 4.786$, $p < .001$, $d = .62$, at T2, $t(186) = 4.842$, $p < .001$, $d = .70$, at T3, $t(154) = 3.303$, $p = .001$, $d = .53$, and at T4, $t(133) = 3.636$, $p < .001$, $d = .62$.

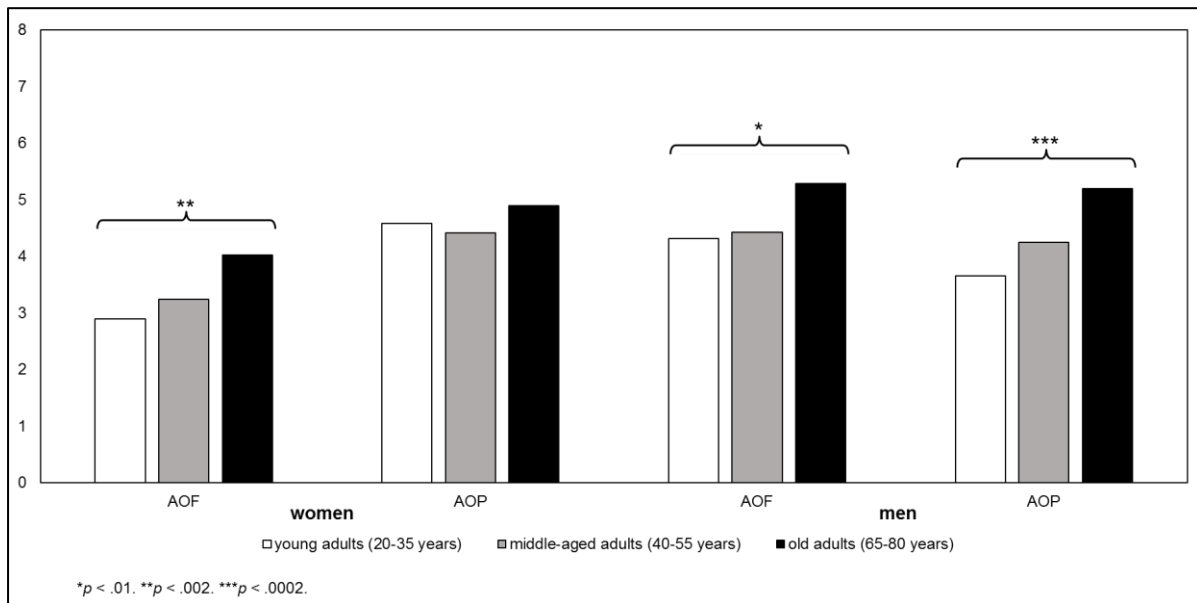


Figure S1. Cross-sectional differences in action orientation at T1 in Study 1. Scale ranges were 0-8 for both AOF and AOP. AOF = Action orientation after failure. AOP = Prospective action orientation.

Longitudinal Analyses of Change within Age Groups

Table S7

Single-Entry Models of AOF and AOP over Time for Each Age Group

Age group	Dependent: <i>AOF</i>			Dependent: <i>AOP</i>		
	young	middle-aged	old	young	middle-aged	old
Fixed effects	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
Intercept	2.885 (0.158)	3.214 (0.154)	3.890 (0.207)	4.400 (0.180)	4.360 (0.175)	4.955 (0.205)
Gender	1.371 (0.261)	1.249 (0.260)	1.459 (0.286)	-0.770 (0.289)	-0.101 (0.261)	0.279 (0.306)
Time (years 0-4)	-0.052 (0.073)	0.067 (0.067)	-0.007 (0.092)	0.087 (0.083)	0.142 (0.076)	0.059 (0.091)
Gender × Time	0.063 (0.083)	0.033 (0.083)	-0.015 (0.099)	0.041 (0.100)	-0.029 (0.087)	-0.048 (0.101)
Random effects (SD)						
Gender	2.171	2.054	2.140	2.180	1.954	2.337
Gender × Time	0.155	0.156	0.291	0.157	0.170	0.211
Residual	2.109	2.135	2.738	2.404	2.434	1.011
Model fit						
-2 log likelihood	3392.2	4055.1	3746.2	3532.6	4194.1	3760.9
AIC	3412.2	4075.1	3766.2	3552.6	4214.1	3780.9
BIC	3459.3	4124.0	3813.8	3599.7	4263.1	3828.6
Sample						
Observations	825	991	867	826	996	878
Couples	122	125	121	122	125	121

Note. *B* = unstandardized regression coefficient. AIC = Akaike Information Criterion. AOF = Action orientation after failure. AOP = Prospective action orientation. Gender is dummy-coded: female = 0, male = 1.

Attrition

The sample was reduced over time from initially 368 couples to 220 couples (-148 couples). Thus, we compared couples which did (participant group) vs. did not (dropout group) participate at all five measurement times with regard to action orientation at T1. For women, the participant group ($M = 3.48$, $SD = 2.31$) and dropout group ($M = 3.21$, $SD = 2.17$) did not differ significantly in AOF, $t(324) = -1.157$, $p = .248$, $d = .12$. Similarly, the participant group ($M = 4.67$, $SD = 2.55$) and the dropout group ($M = 4.55$, $SD = 2.64$) did not differ significantly in AOP, $t(304) = -0.402$, $p = .688$, $d = .04$. For men, there were no differences between the participant group ($M = 4.61$, $SD = 2.53$) and the dropout group ($M = 4.71$, $SD = 2.43$) in AOF, $t(318) = 0.389$, $p = .697$, $d = -.04$. However, the participant group showed significantly lower values ($M = 4.04$, $SD = 2.43$) in comparison with the dropout group ($M = 4.82$, $SD = 2.53$) in AOP, $t(302) = 2.900$, $p = .004$, $d = -.31$. With regard to age groups, this difference was statistically significant for age group 2, $t(71) = 3.077$, $p = .002$, $d = -.55$, and age group 3, $t(100) = 2.172$, $p = .032$, $d = -.40$, but not for age group 1, $t(119) = 0.727$, $p = .468$, $d = -.13$. There were no statistically significant differences between the participant group and the dropout group with regard to action orientation at T2 to T4 (all $p > .05$).

Study 2

Information on Samples

Sample A.

Participants. We used data collected in the context of a larger research project. This research project initially consisted of a longitudinal study with first-year students participating at 12 measurement times over one and a half years. Approximately five years after the first measurement time, participants were invited to fill out a follow-up

questionnaire. The sample of this study consisted of 78 participants (55 females) with a mean age of $M = 20.19$ ($SD = 1.91$), ranging from 18 to 29.

Part of the present data set (i.e., the data from the 12 measurement times) had already been used in other publications (e.g., Herrmann & Brandstätter, 2015; Wolf et al., 2018). Specifically, Wolf et al. (2018) investigated the effect of action orientation on goal setting (i.e., controlled motivation) and goal striving (i.e., goal-related conflict). However, their analyses only included action orientation at measurement time 1 and not the follow-up data on action orientation. Thus, there is no overlap with the herein reported results.

Procedure. The study was advertised via email, flyers, and announcements during lectures and on billboards. The survey was administered with an online tool. Informed consent was obtained at the first measurement time (T1) and at the follow-up questionnaire (T2). In compensation for their participation, participants were emailed a coupon of a popular mail-order company. The coupon had a value of EUR 30 at the first and EUR 10 at each subsequent measurement point (including the follow-up questionnaire).

Sample B.

Participants. We used data collected in the context of a larger research project initially consisting of a longitudinal study with first-year students. One condition for participation was that participants had or already have had some doubts about whether they should continue their studies. Participants filled out the ACS-90 (Kuhl, 1994) at two measurement times approximately one year apart from each other (subsequently denoted as T1 and T2, respectively). The sample of this study consisted of 96 participants (59 females) with a mean age of $M = 20.46$ ($SD = 1.88$), ranging from 18 to 30. The present data set had already been used in a previous publication (Ghassemi, Bernecker, Herrmann, Wolf, & Brandstätter, 2020). Ghassemi et al. (2020) tested the effect of experiencing an intrapsychic

conflict with regard to a personal goal (i.e., an action crisis) on performance with a subsample of study participants.¹ Thus, there is no overlap with the herein reported results.

Procedure. The study was advertised via email, flyers, and announcements during lectures and on billboards. The survey was administered with an online tool. Informed consent was obtained at T1. At T1, participants were compensated with a coupon of a large retail company which had a value of CHF 10. At T2, they received a coupon of a popular mail-order company which had a value of EUR 10.

Sample C.

Participants. This study consisted of data from two separate experimental studies with students, which took place in the same time span and in which action orientation was used as a control variable.² Approximately two years after the experiments, participants were invited to fill out a follow-up questionnaire. The sample of this study consisted of 106 participants (76 females) with a mean age of $M = 21.38$ ($SD = 3.06$), ranging from 18 to 34. There are no previous publications based on this data set.

Procedure. The studies were advertised via email, flyers, and announcements during lectures and on billboards. Informed consent was obtained at T1 and T2. In compensation for their participation at the experimental study, participants received a coupon of a large retail company. The coupon had a value of either CHF 10 or 20 depending on the experimental study (which differed in duration). For participation at the follow-up questionnaire, participants received CHF 20.

Attrition

¹ This subsample (Sample B of Study 2; Ghassemi et al., 2020) only consisted of participants which agreed on using their academic records for research purposes ($n = 41$).

² In one of the studies, experimental condition did have an effect on AOP. Thus, we only included the control condition of this study in the sample.

Sample A. The initial sample at T1 consisted of $N = 205$ individuals, but only 78 individuals participated in T2. Thus, we tested for systematic attrition with regard to action orientation. We compared individuals which did (participant group) vs. did not (dropout group) participate in T2 with regard to action orientation at T1. Regarding AOF, the participant group ($M = 2.94, SD = 2.05$) and the dropout group ($M = 2.46, SD = 1.88$) did not differ significantly, $t(152.4) = 1.673, p = .096, d = .24$. Similarly, for AOP there were also no differences between the participant group ($M = 3.74, SD = 2.57$) and the dropout group ($M = 3.39, SD = 2.58$), $t(163.3) = 0.945, p = .346, d = .14$.

Sample B. The initial sample at T1 consisted of $N = 235$ individuals, but only 96 individuals participated at T2. Again, we compared participants vs. dropouts at T2 with regard to action orientation at T1. The participant group ($M = 2.34, SD = 2.04$) and the dropout group ($M = 2.44, SD = 1.99$) did not differ significantly in AOF, $t(201.3) = 0.355, p = .723, d = -.047$, nor in AOP (participants: $M = 3.29, SD = 2.62$; dropouts: $M = 3.24, SD = 2.34$), $t(188.8) = 0.141, p = .888, d = .02$.

Sample C. The initial sample at T1 consisted of $N = 252$ individuals, but only 106 individuals participated at T2.³ Once more, we compared participants vs. dropouts at T2 with regard to action orientation at T1. The no participant group ($M = 2.46, SD = 2.05$) and the dropout group ($M = 2.64, SD = 2.00$) did not differ significantly in AOF, $t(223.4) = 0.701, p = .484, d = -.09$, nor in AOP (participants: $M = 3.10, SD = 2.58$; dropouts: $M = 2.95, SD = 2.29$), in AOP, $t(210.0) = 0.505, p = .614, d = .07$.

Sample Effects

To assess whether change per year in AOF and AOP differed significantly among the three samples, we included contrasts between samples as moderators of time in the multilevel

³ Participants of the experimental condition of the sample in which condition had an effect on action orientation were excluded from the analyses.

regressions. Specifically, we computed “sum to zero contrasts” which test two samples’ intercepts and slopes against the intercept and slope of the total sample. The intercept and slope of the reference group (C, as it is the largest sample) are not compared to the total.

For AOF, the results indicated no statistically significant differences at baseline, $B = 0.355$, $t(277) = 1.890$, $p = .060$ (sample A), $B = -0.237$, $t(277) = -1.329$, $p = .185$ (sample B). However, change in AOF per year did differ significantly for sample A, $B = -0.202$, $t(277) = -2.750$, $p = .006$, as well as sample B, $B = 0.290$, $t(277) = 2.278$, $p = .024$. This confirms the pattern visible in Figure 3 (solid grey lines), which suggests that AOF increased the most in sample B and the least in sample A. Furthermore, the main effect of change per year reached statistical significance in this model, $B = 0.220$, $t(277) = 3.163$, $p = .002$, indicating that AOF does increase over time when between-samples variance is accounted for.

For AOP, in contrast, there were no statistically significant differences among samples neither at the baseline, $B = 0.364$, $t(277) = 1.548$, $p = .123$ (sample A), $B = -0.088$, $t(277) = -0.395$, $p = .693$ (sample B), nor regarding change per year, $B = -1.22$, $t(277) = 1.484$, $p = .139$ (sample A), $B = -0.098$, $t(277) = -0.687$, $p = .493$ (sample B). Consistent with the model that did not include sample differences, the main effect of change per year in AOP was also significantly positive, $B = 0.171$, $t(277) = 2.192$, $p = .029$.

Study S3

Method

Participants. In this study, we used data collected in the context of a larger research project initially consisting of a longitudinal study with applicants for a trainee position at two Swiss police departments. Participants filled out three questionnaires over the course of the selection process. Approximately one year after the first questionnaire (T1), participants were invited to fill out a follow-up questionnaire (T2). The sample of this study consisted of 110

participants (41 females) with a mean age of $M = 25.12$ ($SD = 3.44$), ranging from 20 to 34. Part of the present data set (i.e., the data from the three questionnaires over the course of the selection process) had already been used in other publications (Bettschart, Herrmann, Wolf, & Brandstätter, 2019, 2020). However, these publications focused on other aspects (the predictive validity of an achievement motive scale, the effect of failure during goal pursuit on the experience of goal-related doubts) and did not include action orientation in their analyses. Thus, there is no overlap with the herein reported results.

Procedure. Along with the invitation to the first stage of the selection process, applicants were invited by the police departments to participate in the present study. Informed consent was obtained at T1 and T2. They received a compensation of CHF 50 for their participation at all three questionnaires and additional CHF 30 for their participation at the follow-up questionnaire.

Measures. Action orientation was assessed with the 24-item version of the Action Control Scale (ACS-90; Kuhl, 1994) at T1 and T2. We removed the same items as in Study 1 to be able to draw inferences between our studies and over time. Thus, both action orientation after failure (AOF) and prospective action orientation (AOP) were measured with 8 items. Internal consistency was $\alpha = .63$ at T1 and $\alpha = .74$ at T2 for AOF and $\alpha = .74$ at T1 and $\alpha = .74$ at T2 for AOP.

Statistical analyses. We used multilevel modeling to analyze change in AOF and AOP from T1 to T2 and to test for gender differences. Time was coded as 0 (T1) and 1 (T2). To test for gender differences, a dummy-coded gender variable (0 = female, 1 = male) was used.

Results and Discussion

Stability. We calculated the rank-order stability of the two scales from T1 to T2 (i.e., over approximately one year). For AOF, stability was $r_{T1T2} = .57, p < .001$; for AOP, stability was $r_{T1T2} = .56, p < .001$.

Change. There was a statistically significant negative change from T1 ($M = 5.72, SD = 1.87$) to T2 ($M = 5.12, SD = 2.25$) for AOF, $B = -0.600, p = .002$. There was a statistically non-significant negative change from T1 ($M = 6.34, SD = 1.92$) to T2 ($M = 6.05, SD = 2.02$) for AOP, $B = -0.291, p = .103$. When comparing women and men, there were no differences in the intercept for AOF, $B = -0.445, p = .230$, and AOP, $B = 0.008, p = .983$. Above that, there were no gender differences in the change in AOF, $B = 0.062, p = .872$, and AOP, $B = 0.075, p = .839$.

Attrition. The initial sample at T1 consisted of $N = 335$ individuals, but only 110 individuals participated in T2. Thus, we tested for systematic attrition with regard to action orientation. We compared individuals which did (participant group) vs. did not (dropout group) participate in T2 with regard to action orientation at T1. Regarding AOF, the participant group ($M = 5.72, SD = 1.87$) and the dropout group ($M = 5.79, SD = 1.83$) did not differ significantly, $t(212) = 0.337, p = .736, d = -.04$. Similarly, for AOP there were also no differences between the participant group ($M = 6.34, SD = 1.92$) and the dropout group ($M = 6.51, SD = 1.80$), $t(205) = 0.779, p = .437, d = -.09$.

Discussion. In this study, participants had rather high values in AOF and AOP both at T1 and T2 in comparison with previous studies of this age group. In addition, there was a statistically significant decrease in AOF, paralleling the finding for young women in Study 1. However, results of this study should be interpreted with caution, as participants had very high values in both AOF and AOP, especially at T1 (the means were even higher than the means of old adults in Study 1). This might have been due to the setting of the study:

Participants were applying for training at a police department, which is a rather selective sample⁴ and, in addition, the situation might have triggered socially desirable responding.

⁴ There is some evidence that police officers have higher values in action orientation compared to the general population (Landman et al., 2016), which might also be the case for individuals applying for training as a police officer.

References

- Bettschart, M., Herrmann, M., Wolf, B. M., & Brandstätter, V. (2019). The seed of goal-related doubts: A longitudinal investigation of the roles of failure and expectation of success among police trainee applicants. *Frontiers in Psychology, 10*, 1–8. <https://doi.org/10.3389/fpsyg.2019.02151>
- Bettschart, M., Herrmann, M., Wolf, B. M., & Brandstätter, V. (2020). Investigating the Unified Motive Scales: The predictive validity of the achievement motive subscale. *European Journal of Psychological Assessment*. Advance online publication. <https://doi.org/10.1027/1015-5759/a000571>
- Herrmann, M., & Brandstätter, V. (2015). Action crises and goal disengagement: Longitudinal evidence on the predictive validity of a motivational phase in goal striving. *Motivation Science, 1*(2), 121–136. <https://doi.org/10.1037/mot0000016>
- Ghassemi, M., Bernecker, K., Herrmann, M., Wolf, B. M., & Brandstätter, V. (2020). Doubting impairs acting: Feeling torn between goal persistence and disengagement. *Motivation Science*. Advance online publication. <https://psycnet.apa.org/doi/10.1037/mot0000210>
- Kuhl, J. (1994). Action versus state orientation: Psychometric properties of the Action Control Scale (ACS-90). In J. Kuhl & J. Beckmann (Eds.), *Volition and personality: Action versus state orientation* (pp. 47–59). Seattle, WA: Hogrefe & Huber.
- Landman, A., Nieuwenhuys, A., & Oudejans, R. R. D. (2016). Decision-related action orientation predicts police officers' shooting performance under pressure. *Anxiety, Stress, & Coping, 29*(5), 570–579. <https://doi.org/10.1080/10615806.2015.1070834>
- Wolf, B. M., Herrmann, M., & Brandstätter, V. (2018). Self-efficacy vs. action orientation: Comparing and contrasting two determinants of goal setting and goal striving. *Journal of Research in Personality, 73*, 35–45. <https://doi.org/10.1016/j.jrp.2017.11.001>