

Student-Athletes' Academic and Athletic Motivation Scale (SAAMS) for Adolescents in Secondary School: Development,
Evaluation, and Psychometric Properties
- Electronic Supplement -

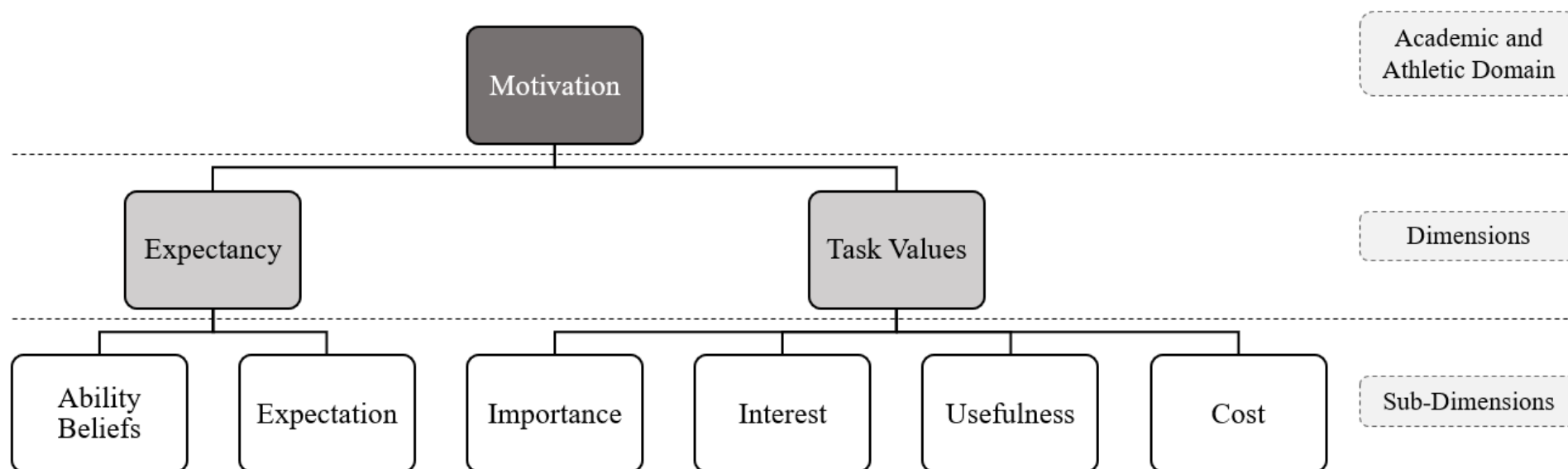


Fig. S1. Schematic representation of the expectancy-value framework underlying the Student-Athletes Athletic and Academic Motivation Scale.

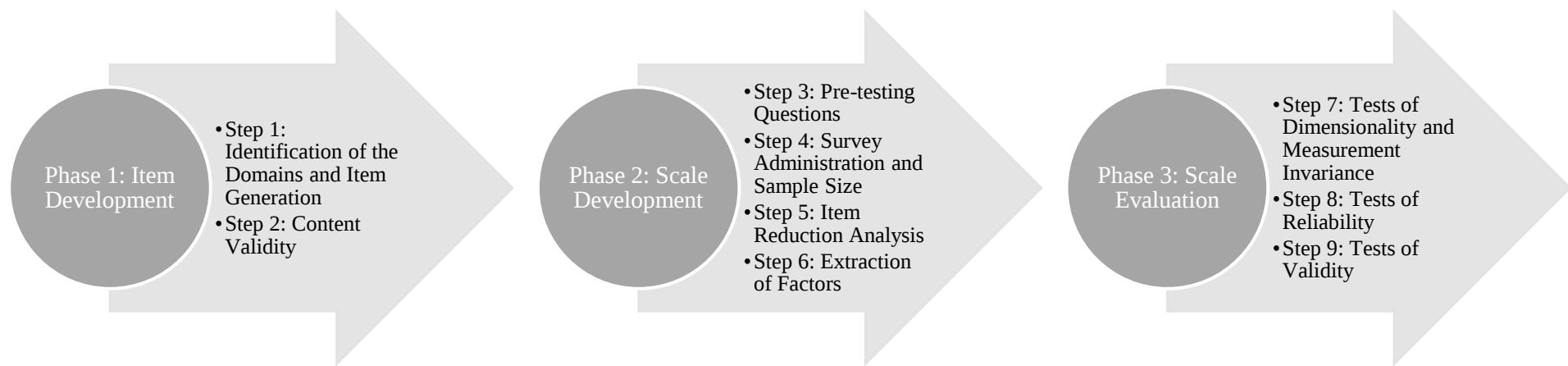


Fig. S2. Procedure for developing and evaluating the Student-Athletes' Academic and Athletic Motivation Scale following Boateng et al. (2018).

Tab. S1. Items of the initial Student-Athletes' Academic and Athletic Motivation Scale (SAAMS).

Item Title	German Original	English Translation
Ability Beliefs <i>Academic Ability Beliefs: Mean = 3.41, SD = .78 Athletic Ability Beliefs: Mean = 3.96, SD = .63</i>		
AcAbi1/AtAbi1	Ich bin sehr gut in der Schule/im Sport.	I am very good in school/at sport.
AcAbi2/AtAbi2	Ich lerne generell sehr schnell neue Dinge in der Schule/beim Sport.	I learn new things very fast in school/sport.
AcAbi3/AtAbi3	Es fällt mir überhaupt nicht schwer, neue Dinge in der Schule/beim Sport zu erlernen.	I do not find it difficult at all to learn new things in school/sport.
AcAbi4/AtAbi4	Ich brauche ein bisschen mehr Zeit als die anderen, um mir in der Schule/beim Sport neue Dinge anzueignen. (-)	I need a little bit more time than others in order to acquire new things in school/sport.
AcAbi5/AtAbi5	Ich bin in der Schule/beim Sport viel besser als andere in meinem Alter.	I am much better in school/at sport than others my age.
AcAbi6/AtAbi6	In der Schule/Beim Sport traue ich mir manche Dinge nicht zu. (-)	I do not dare some things in school/sport.
Expectations <i>Academic Expectations: Mean = 3.40, SD = .79 Athletic Expectation: Mean = 3.74, SD = .96</i>		
AcExp1/AtExp1	Ich rechne damit in diesem Schuljahr sehr gute Noten auf dem Zeugnis zu erreichen./Ich rechne damit in dieser Saison im Sport sehr gute Leistungen zu bringen.	I expect to receive very good grades on my school report in this academic year. I expect to achieve very good results in sport in this season.
AcExp2/AtExp2	Ich erwarte, dass ich in diesem (Schul-)Jahr alle schulischen/sportlichen Herausforderungen meistern werde.	I expect that I will manage all academic/athletic challenges in this (academic) year.
AcExp4/AtExp4	Ich bin mir unsicher, ob ich meine schulischen/sportlichen Leistungen erbringen werde. (-)	I am unsure whether I will be able to reach my academic/athletic performances. (-)
AcExp5/AtExp5	Ich rechne damit, dass sich meine Leistungen in der Schule/im Sport positiv entwickeln werden.	I expect that my performances in school/sport will develop positively.
Importance <i>Academic Importance: Mean = 3.20, SD = .94 Athletic Importance: Mean = 4.30, SD = 1.02</i>		
AcImp1/AtImp1	Es ist mir sehr wichtig zu lernen, was in meinem Unterricht/Training vermittelt wird.	It is very important to me to learn what is taught in my lessons/training.
AcImp2/AtImp2	Es ist mir sehr wichtig mir die Inhalte anzueignen, die meine Lehrkräfte/Trainer/innen mir vermitteln.	It is very important to me to acquire the contents that my teachers/coaches teach.
AcImp4/AtImp4	Ich lege viel Wert auf sehr gute Noten/Leistungen in der Schule/im Sport.	I attach importance to very good grades/results in school/sport.
AcImp5/AtImp5	Die Schule/Der Sport ist mir wichtiger als die meisten anderen Bereiche meines Lebens.	School/Sport is more important to me than most other areas of my life.
Interest <i>Academic Interest: Mean = 2.04, SD = .95 Athletic Interest: Mean = 4.16, SD = 1.07</i>		
AcInt1/AtInt1	Was wir im Unterricht/Training machen, finde ich spannend.	I am thrilled by what we are doing in lessons/training.
AcInt4/AtInt4	Die von mir gewählten Schulfächer/Mein Leistungssport spiegeln mein Interesse wider in diesem Bereich einen Beruf zu erlernen.	The subjects I chose/My elite sport shows my interest to acquire a job in this field.
AcInt5/AtInt5	In den meisten Schulfächern/Im Training bringe ich mich von selbst aktiv ein.	I participate in lessons/training by myself.

AcInt6/AtInt6	Schwierigen Aufgaben im Unterricht/Training reizen mich.	I am attracted to difficult tasks in lessons/training.
Usefulness <i>Academic Usefulness: Mean = 2.64, SD = 1.06 Athletic Usefulness: Mean = 3.97, SD = 1.14</i>		
AcUse1/AtUse1	Kompetenzen, die ich in der Schule/im Sport erlangt habe, sind für meinen Lebensweg von Nutzen.	Competencies that I acquired in school/sport are useful for my life journey.
AcUse2/AtUse2	Ich wende vieles von dem, was ich in der Schule/im Sport lerne, auch in anderen Lebensbereichen an.	Many of the things I learn in school/sport I use for other aspects of life.
AcUse3/AtUse3	Das, was ich in der Schule/im Sport gelernt habe, bereitet mich auf meine Zukunft vor.	The things we learn in school/sport prepare me well for my future.
AcUse4/AtUse4	Kompetenzen, die ich in der Schule/im Sport erwerbe, sind für mich hilfreich.	Competencies that I acquire in school/sport are helpful to me.
Cost <i>Academic Cost: Mean = 2.82, SD = .83 Athletic Cost: Mean = 3.98, SD = 1.05</i>		
AcCos1/AtCos1	Wegen der Schule/des Sports bleiben viele Dinge auf der Strecke.	Due to school/sport, other things fall by the wayside.
AcCos4/AtCos4	Weil ich so viele andere Dinge zu tun habe, habe ich nicht genug Zeit für die Schule/den Sport. (-)	Because I have so many other things to do, I do not have enough time for school/sport. (-)
AcCos5/AtCos5	Ich verzichte auf andere Dinge, damit ich mich auf die Schule/den Sport konzentrieren kann.	I do without other things in order to concentrate on school/sport.
AcCos6/AtCos6	Die Anforderungen in der Schule/im Sport verlangen mir alles ab.	The requirements in school/sport overcharge me.

Notes. The English translation of the items are ad hoc translations which have neither been tested nor validated. Only the German items have been tested.

(-) = This item needs to be reverse coded for the data analysis.

Tab. S2. Items of the final Student-Athletes' Academic and Athletic Motivation Scale (SAAMS).

Item Title	German Original	English Translation
Ability Beliefs <i>Academic Ability Beliefs: Mean = 3.47, SD = .74 Athletic Ability Beliefs: Mean = 3.95, SD = .65</i>		
AcAbi1/AtAbi1	Ich bin sehr gut in der Schule/im Sport.	I am very good in school/at sport.
AcAbi2/AtAbi2	Ich lerne generell sehr schnell neue Dinge in der Schule/beim Sport.	I learn new things very fast in school/sport.
AcAbi3/AtAbi3	Es fällt mir überhaupt nicht schwer, neue Dinge in der Schule/beim Sport zu erlernen.	I do not find it difficult at all to learn new things in school/sport.
AcAbi4/AtAbi4	Ich brauche ein bisschen mehr Zeit als die anderen, um mir in der Schule/beim Sport neue Dinge anzueignen. (-)	I need a little bit more time than others in order to acquire new things in school/sport. (-)
AcAbi5/AtAbi5	Ich bin in der Schule/beim Sport viel besser als andere in meinem Alter.	I am much better in school/at sport than others my age.
AcAbi6/AtAbi6	In der Schule/Beim Sport traue ich mir manche Dinge nicht zu. (-)	I do not dare some things in school/sport. (-)
Expectations <i>Academic Expectations: Mean = 3.59, SD = .73 Athletic Expectation: Mean = 4.08, SD = .76</i>		
AcExp1/AtExp1	Ich rechne damit in diesem Schuljahr sehr gute Noten auf dem Zeugnis zu erreichen./Ich rechne damit in dieser Saison im Sport sehr gute Leistungen zu bringen.	I expect to receive very good grades on my school report in this academic year. I expect to achieve very good results in sport in this season.
AcExp2/AtExp2	Ich erwarte, dass ich in diesem (Schul-)Jahr alle schulischen/sportlichen Herausforderungen meistern werde.	I expect that I will manage all academic/athletic challenges in this (academic) year.
AcExp3/AtExp3	Ich rechne damit, in diesem Schuljahr/in dieser Saison die schulischen/sportlichen Leistungen zu erreichen, die ich mir vornehme.	I expect to reach the academic/athletic results in this academic year/season that I undertake.
AcExp5/AtExp5	Ich rechne damit, dass sich meine Leistungen in der Schule/im Sport positiv entwickeln werden.	I expect that my performances in school/sport will develop positively.
AcExp6/AtExp6	Ich erwarte, dass ich in diesem Schuljahr/in dieser Saison in der Schule/im Sport Neues erlerne.	I expect to learn new things in school/sport in this academic year/season.
Importance <i>Academic Importance: Mean = 3.17, SD = .76 Athletic Importance: Mean = 4.38, SD = .66</i>		
AcImp1/AtImp1	Es ist mir sehr wichtig zu lernen, was in meinem Unterricht/Training vermittelt wird.	It is very important to me to learn what is taught in my lessons/training.
AcImp2/AtImp2	Es ist mir sehr wichtig mir die Inhalte anzueignen, die meine Lehrkräfte/Trainer/innen mir vermitteln.	It is very important to me to acquire the contents that my teachers/coaches teach.
AcImp3/AtImp3	Es ist mir wichtig, sehr gute Leistungen in der Schule/im Sport zu erbringen.	It is important to me to deliver very good results in school/sport.
AcImp6/AtImp6	Es ist mir wichtig, in der Schule/im Sport besser zu sein als meine MitschülerInnen/andere AthletInnen.	It is important to me to be better in school/at sport than my classmates/other athletes.
AcImp7/AtImp7	Die Schule/Der Sport ist für mich ein wichtiger Teil meines Lebens.	School/Sport is an important part of my life.
AcImp8/AtImp8	Ich lege viel Wert darauf, im Unterricht/Training nichts zu verpassen.	I attach importance to not missing anything in lessons/training.
Interest <i>Academic Interest: Mean = 2.73, SD = .78 Athletic Interest: Mean = 4.17, SD = .73</i>		

AcInt1/AtInt1	Was wir im Unterricht/Training machen, finde ich spannend.	I am thrilled by what we are doing in lessons/training.
AcInt2/AtInt2	Ich interessiere mich für die Inhalte, die im Unterricht/Training vermittelt werden.	I am interested in the contents that are taught in lessons/training.
AcInt3/AtInt3	Ich finde interessant, was wir in der Schule/im Training machen.	I find things interesting that we do in school/training.
AcInt4/AtInt4	Die von mir gewählten Schulfächer/Mein Leistungssport spiegeln mein Interesse wider in diesem Bereich einen Beruf zu erlernen.	The subjects I chose/My elite sport shows my interest to acquire a job in this field.
AcInt7/AtInt7	Anspruchsvolle Aufgabe im Unterricht/Training wecken mein Interesse.	Challenging tasks in lessons/training arouse my interest.
AcInt8/AtInt8	Mein Interesse für die Schule/meinen Sport ist sehr hoch.	My interest for school/my sport is very high.
Usefulness <i>Academic Usefulness: Mean = 2.51, SD = .80 Athletic Usefulness: Mean = 3.88, SD = .83</i>		
AcUse1/AtUse1	Kompetenzen, die ich in der Schule/im Sport erlangt habe, sind für meinen Lebensweg von Nutzen.	Competencies that I acquired in school/sport are useful for my life journey.
AcUse2/AtUse2	Ich wende vieles von dem, was ich in der Schule/im Sport lerne, auch in anderen Lebensbereichen an.	Many of the things I learn in school/sport I use for other aspects of life.
AcUse3/AtUse3	Das, was ich in der Schule/im Sport gelernt habe, bereitet mich auf meine Zukunft vor.	The things we learn in school/sport prepare me well for my future.
Cost <i>Academic Cost: Mean = 2.95, SD = .42 Athletic Cost: Mean = 3.83, SD = .53</i>		
AcCos1/AtCos1	Wegen der Schule/des Sports bleiben viele Dinge auf der Strecke.	Due to school/sport, other things fall by the wayside.
AcCos2/AtCos2	Wegen der Schule/des Sports muss ich auf Einiges verzichten, das ich gerne mache.	Due to school/sport I have to do without things that I like doing.
AcCos3/AtCos3	Ich muss wegen der Schule/des Sports Einschränkungen auf mich nehmen.	I have to accept restrictions due to school/sport.
AcCos5/AtCos5	Ich verzichte auf andere Dinge, damit ich mich auf die Schule/den Sport konzentrieren kann.	I do without other things in order to concentrate on school/sport.
AcCos6/AtCos6	Die Anforderungen in der Schule/im Sport verlangen mir alles ab.	The requirements in school/sport overcharge me.
AcCos7/AtCos7	Ich habe genug Zeit für die Schule/den Sport, obwohl ich auch andere Dinge zu tun habe.	I have enough time for school/sport although there are other things I have to do.
AcCos8/AtCos8	Die Anforderungen in der Schule/im Sport überfordern mich. (-)	The requirements in school/sport overload me. (-)
AcCos9/AtCos9	Ich habe einfach zu wenig Zeit für die Schule/meinen Sport. (-)	I just do not have enough time for school/my sport. (-)

Notes. The English translation of the items are ad hoc translations which have neither been tested nor validated. Only the German items have been tested.

(-) = This item needs to be reverse coded for the data analysis.

green = This item remained in the final SAAMS version.

orange = This item worked in a solution where each factor is represented by four items.

Tab. S3. Factor loadings of the four-factor-model for the academic and athletic motivation using exploratory factor analysis for the initial SAAMS version.

	Ability	Expectation	Importance, Interest, Usefulness	Cost
AcAbi1	.70	.39		
AcAbi2	.79			
AcAbi3(-)	.75			
AcAbi4	.75			
AcAbi5	.68	.32		
AcAbi6(-)	.49			
AcExp1	.53	.55		
AcExp2		.61		
AcExp4(-)	.41	.33		.44
AcExp5		.54		
AcImp1			.48	
AcImp2			.55	
AcImp4	.37	.45	.34	
AcImp5			.36	-.48
AcInt1			.65	
AcInt4			.47	
AcInt5	.50			
AcInt6	.47			
AcUse1			.81	
AcUse2			.68	
AcUse3			.76	
AcUse4			.79	
AcCos1				-.67
AcCos4(-)				.37
AcCos5				-.75
AcCos6				-.54
AtAbi1	.52			
AtAbi2	.73			
AtAbi3	.71			
AtAbi4(-)	.70			
AtAbi5	.42			
AtAbi6(-)	.38			
AtExp1		.78		
AtExp2		.69		
AtExp4(-)		.57		
AtExp5		.65		
AtImp1			.73	
AtImp2			.75	
AtImp4		.32	.56	
AtImp5			.43	
AtInt1			.53	
AtInt4		.47	.37	
AtInt5			.58	.33
AtInt6			.47	
AtUse1				.83
AtUse2				.78
AtUse3				.75
AtUse4			.52	.61
AtCos1				
AtCos4(-)				
AtCos5				.43
AtCos6				.42

Notes. (-) = This item was reverse coded for the data analysis.

Tab. S4. Factor loadings of the five-factor-model for the academic and athletic motivation using exploratory factor analysis for the initial SAAMS version.

	Ability	Expectation	Importance, Interest	Usefulness	Cost
AcAbi1	.70	.40			
AcAbi2	.79				
AcAbi3	.75				
AcAbi4(-)	.74				
AcAbi5	.69	.32			
AcAbi6(-)	.50				
AcExp1	.53	.58			
AcExp2		.61			
AcExp4(-)	.42	.34			.42
AcExp5		.51			
AcImp1			.77	.35	
AcImp2			.53	.45	
AcImp4	.36	.43	.30		
AcImp5				.34	-.48
AcInt1				.62	
AcInt4				.43	
AcInt5	.50				
AcInt6	.47				
AcUse1				.81	
AcUse2				.68	
AcUse3				.78	
AcUse4				.77	
AcCos1					-.68
AcCos4(-)					.36
AcCos5					-.77
AcCos6					-.54
AtAbi1	.51				.40
AtAbi2	.74				
AtAbi3	.69				
AtAbi4(-)	.69				
AtAbi5	.41				.35
AtAbi6(-)	.37				
AtExp1		.77			
AtExp2		.70			
AtExp4(-)		.60			
AtExp5		.67			
AtImp1			.75		
AtImp2			.78		
AtImp4		.31	.50		.40
AtImp5			.34		.50
AtInt1			.54		
AtInt4		.46	.31		.35
AtInt5			.60		
AtInt6			.45		
AtUse1				-.79	
AtUse2				-.77	
AtUse3				-.73	
AtUse4			.53	-.54	
AtCos1					.53
AtCos4(-)					
AtCos5				-.32	.58
AtCos6				-.35	.34

Notes. (-) = This item was reverse coded for the data analysis.

Tab. S5. Factor loadings of the six-factor-model for the academic and athletic motivation using exploratory factor analysis for the initial SAAMS version.

	Ability	Expectation	Importance, Interest	Unclear	Usefulness	Cost
AcAbi1	.70	.39				
AcAbi2	.79					
AcAbi3	.77					
AcAbi4(-)	.75					
AcAbi5	.69	.32				
AcAbi6(-)	.49					
AcExp1	.54	.57				
AcExp2		.61				
AcExp4(-)	.42	.36				-.35
AcExp5		.52				
AcImp1			.75		.35	
AcImp2			.55		.44	
AcImp4	.36	.41	.32			
AcImp5					.32	.48
AcInt1					.62	
AcInt4					.42	
AcInt5	.50					
AcInt6	.47					
AcUse1					.81	
AcUse2					.68	
AcUse3					.78	
AcUse4					.77	
AcCos1						.63
AcCos4(-)				.79		
AcCos5						.91
AcCos6						.48
AtAbi1	.52					.33
AtAbi2	.76					
AtAbi3	.69					
AtAbi4(-)	.68					
AtAbi5	.43					.31
AtAbi6(-)	.37					
AtExp1		.83				
AtExp2		.70				
AtExp4(-)		.57				
AtExp5		.63				
AtImp1			.75			
AtImp2			.80			
AtImp4		.30	.50			.31
AtImp5			.34	.49		.37
AtInt1			.54			
AtInt4		.44	.32			
AtInt5			.59		-.30	
AtInt6			.45			
AtUse1					-.79	
AtUse2					-.77	
AtUse3					-.75	
AtUse4			.53		-.56	
AtCos1						.62
AtCos4(-)						
AtCos5					-.33	.56
AtCos6					-.36	.32

Notes. (-) = This item was reverse coded for the data analysis.

Tab. S6. Model fits of the four-, five- and six-factor model for the academic and athletic motivation using exploratory factor analysis for the initial SAAMS version.

	RMSEA	RMSR	Chi ² -value	degrees of freedom	p-value
Academic Motivation					
Four-Factor-Model	.06	.04	516.75	227	<.001
Five-Factor-Model	.05	.03	387.88	205	<.001
Six-Factor-Model	.04	.03	304.76	184	<.001
Athletic Motivation					
Four-Factor-Model	.07	.05	574.02	227	<.001
Five-Factor-Model	.06	.03	403.72	205	<.001
Six-Factor-Model	.05	.03	319.89	184	<.001

Tab. S7. Differences between the initial and final version of the SAAMS.

Domain	Changes to the initial SAAMS scale
Ability	• No changes
Expectation	• Removal of item 4 • Addition of item 3 and 6
Importance	• Removal of item 4 and 5 • Addition of item 3, 6, 7, and 8
Interest	• Removal of item 5 and 6 • Addition of item 2, 3, 7, and 8
Usefulness	• Removal of item 4
Cost	• Removal of item 4 • Addition of item 2, 3, 7, 8, and 9

Tab. S8. Model fits for the five-factor-model for the academic and athletic motivation using confirmatory factor analysis for the final SAAMS.

	RMSEA	SRMR	CFI	Chi ² -value	degrees of freedom	p-value
Academic Motivation	.09	.07	.86	4117.41	153	<.001
Athletic Motivation	.06	.05	.95	4467.97	153	<.001

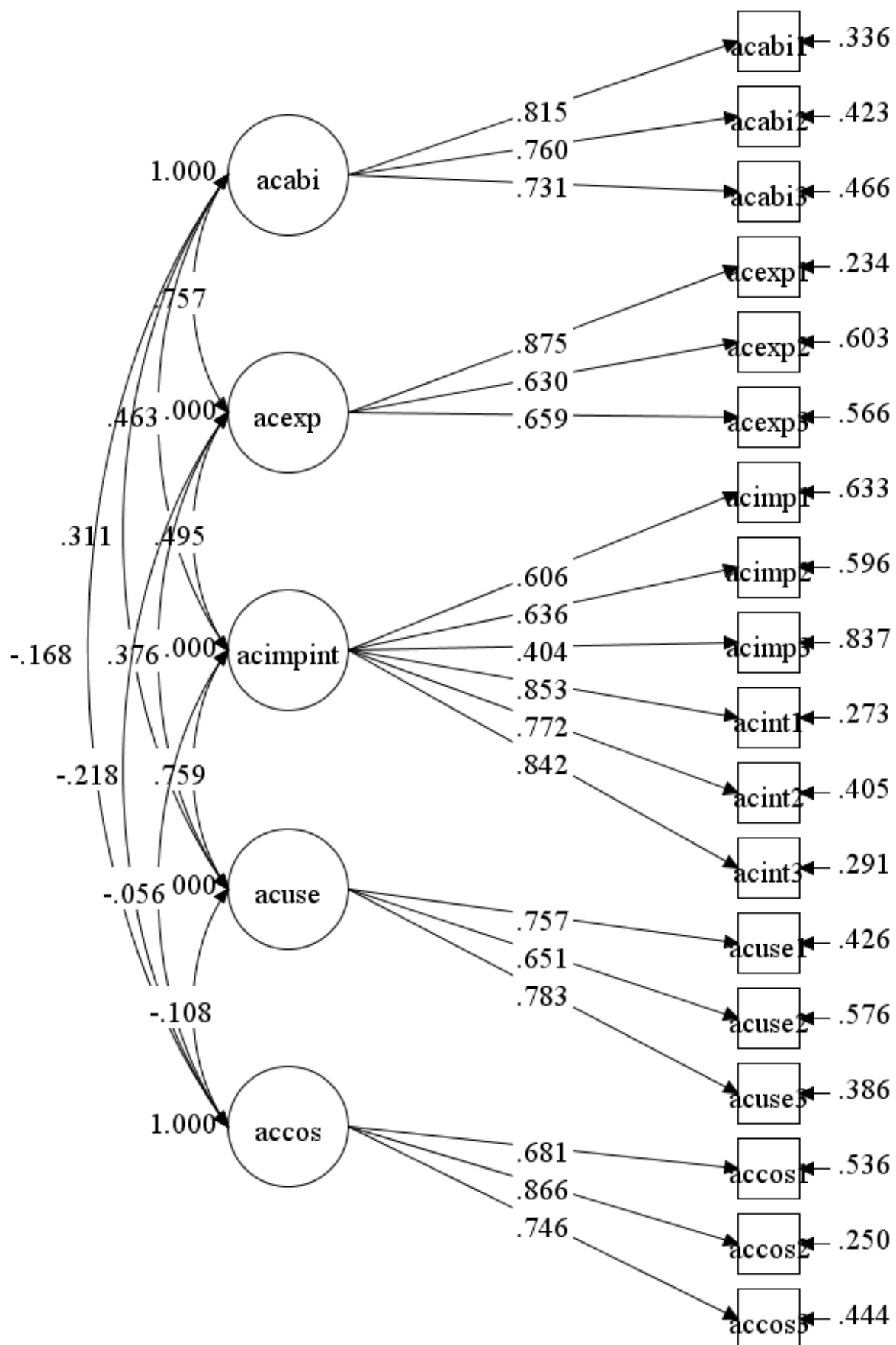


Fig. S3. Results for the confirmatory factor analysis regarding the five-factor model for the academic motivation of the final SAAMS version.

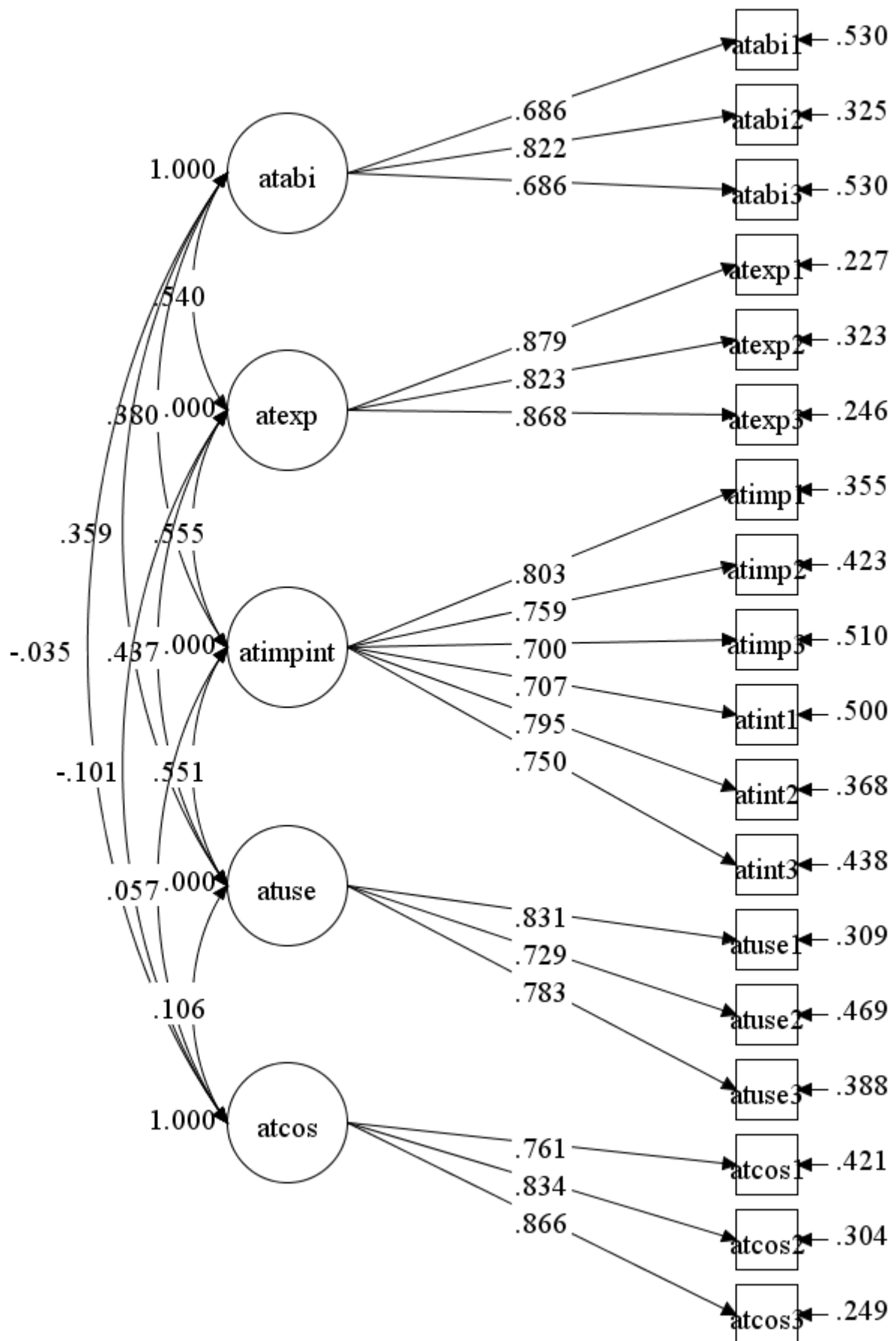


Fig. S4. Results for the confirmatory factor analysis regarding the five-factor model for the athletic motivation of the final SAAMS version.