P8158 - Investigating the Effect of Athletic Identity on Overall Well-Being during COVID-19

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Motivation

- The onset of COVID-19 affected almost every sphere of work and leisure.
- We are interested in investigating the impact athletic identity may have had on athletes' overall well-being, particularly as the context of a global pandemic may have dramatically impacted one's experience of playing a sport/being an athlete.

Methodology

1. Conduct PCA to estimate number of components (n) underlying observed variables.
2. Run EFA models on n and $n \pm 1$ components, compare fit statistics and interpretability to select structure to move forward with.
3. Perform CFA to evaluate fit of latent structure.
4. Evaluate reliability of the determined latent variables with Chronbach's alpha.
5. Construct SEM(s) to quantify the relationship between our constructed latent variables and mental health score.

Data: Athlete Mental Health Survey

The dataset we selected contains responses for several surveys administered in the UK to assess athlete (and non-athlete) mental health and well-being after the country's first COVID-19 lockdown.

These surveys include:

- Athletic Identity Scale (AIMS)
- The Brief Resilience Scale (BRS)
- Mental Health Continuum Short Form (MHC-SF)

In total, 753 individuals were interviewed – we will focus our analysis on the 363 athletes represented in this study (reserving the 390 non-athletes for a comparison analysis).

Variables of Interest

Latent:

- Athletic Identity
- Resilience (potential mediator)
- Healthy Lifestyle (potential mediator)

Observed Outcome:

- MHC-SF Sum Score

Latent Variable 1: Athletic Identity

First Order Factors	AIMS Items
Social identity	
AIMS 1	I consider myself an athlete. CNSDR_ATH
AIMS 2	I have many goals related to sport. SPRT_GOALS
AIMS 3	Most of my friends are athletes. FRNDS_ATH
Exclusivity	
AIMS 4	Sport is the most important part of my life. SPRT_IMPT
AIMS 5	I spend more time thinking about sport than anything else. THINK_SPRT
Negative affectivity	
AIMS 6	I feel bad about myself when I do poorly in sport. BAD_SPRT
AIMS 7	I would be very depressed if I were injured and could not compete in sport. DPRS_SPRT

Note: Participants respond to the 7-items of the Athletic Identity Measurement Scale (AIMS) on a Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Athletic Identity Scale (AIMS)

Latent Variable 1 (Athletic Identity): EFA

After conducting EFA, we first propose that there are three latent variables underlying the AIMS variables, structured as follows:

- `external_identity` (comprised of `sprt_goals`, `cnsdr_ath`, `frnds_ath`)
- `internal_value` (comprised of `sprt_impt`, `think_sprt`)
- `negative_events` (comprised of `dprs_sprt`, `bad_sprt`)

Latent Variable 1 (Athletic Identity): Reliability

Chronbach's alphas were reasonable for `internal_value` and `negative_events` (0.81 and 0.63, respectively). No variables indicated that could be dropped to improve reliability for either latent variable.

However, for `external_identity`:

```
 lower alpha upper     95% confidence bc
0.59 0.65 0.72

 Reliability if an item is dropped:
            raw_alpha std.alpha G6(smc) a
cnsdr_ath        0.47      0.49    0.33
sprt_goals       0.46      0.47    0.31
frnds_ath        0.75      0.76    0.61
```

Since Chronbach's alpha for `external_identity` would improve significantly if `frnds_ath` is removed, we decided to remove this variable from the latent structure.

Latent Variable 1 (Athletic Identity): CFA

We hypothesized that there exists a second-order latent variable, `athletic_identity`, underlying the latent variables `external_identity`, `internal_value`, and `negative_events`. Conducting a CFA allows us to evaluate this hypothesis:

Latent Variables:

	Estimate	Std.Err	z-value	P(>|z|)
external_identity =~				
sprt_goals	0.677	0.073	9.247	0.000
cnsdr_ath	0.584	0.056	10.404	0.000
internal_value =~				
sprt_impt	0.627	0.109	5.728	0.000
think_sprt	0.840	0.166	5.077	0.000
negative_events =~				
dprs_sprt	0.625	0.078	8.053	0.000
bad_sprt	0.799	0.103	7.777	0.000
athlete_identity =~				
external_dntty	0.809	0.143	5.658	0.000
internal_value	1.396	0.374	3.729	0.000
negative_evnts	0.813	0.152	5.364	0.000

Fit statistics: CFI > 0.99, RMSEA < 0.05, $\chi^2 = 0.514$

Latent Variable 2: Resilience

	Please respond to each item by marking one box per row	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
BRS 1	I tend to bounce back quickly after hard times BOUNCE	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
BRS 2	I have a hard time making it through stressful events. STRS_EVNT	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
BRS 3	It does not take me long to recover from a stressful event. STRS_RCVR	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
BRS 4	It is hard for me to snap back when something bad happens. SNAP_BACK	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
BRS 5	I usually come through difficult times with little trouble. DIFFICULT	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
BRS 6	I tend to take a long time to get over set-backs in my life. SETBACKS	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1

The Brief Resilience Scale (BRS)

Latent Variable 2 (Resilience): EFA

After running EFA on 1- and 2- factor models, we find that the 1-factor model, containing all variables from the scale fits the best.

Latent Variable 2 (Resilience): Reliability

```
 lower alpha upper     95% confidence bou
0.87 0.89 0.9

 Reliability if an item is dropped:
           raw_alpha std.alpha G6(smc) ave
bounce          0.87      0.87    0.85
strs_evnt       0.86      0.86    0.84
strs_rcvr       0.87      0.87    0.85
snap_back       0.86      0.86    0.84
difficult       0.88      0.88    0.86
setbacks        0.85      0.85    0.83
```

Latent Variable 2 (Resilience): CFA

Latent Variables:

	Estimate	Std.Err	z-value	P(>|z|)
resilience =~				
bounce	0.662	0.045	14.732	0.000
strs_evnt	0.852	0.052	16.419	0.000
strs_rcvr	0.679	0.051	13.415	0.000
snap_back	0.814	0.048	17.031	0.000
difficult	0.644	0.051	12.559	0.000
setbacks	0.828	0.046	17.954	0.000

Fit statistics: CFI > 0.98, RMSEA < 0.08, $\chi^2 = 0.017$

Latent Variable 3: Healthy Lifestyle

We hypothesized that we could create a latent variable representing a healthy lifestyle using the following variables:

- `fruit_veg`: Five Fruit and Vegetables (Yes/No)
- `smoking`: Smoking Status (7-point Likert scale)
- `hr_sleep`: Hour Sleep (numeric variable)

Latent Variable 3 (Healthy Lifestyle): Reliability

```
 lower alpha upper     95% conf
-0.47 -0.26 -0.04

 Reliability if an item is drop
           raw_alpha std.alpha G
hr_sleep     -0.112    -0.150
smoking       0.043     0.055
fruit_veg    -0.330    -0.330
```

Latent Variable 3: Healthy Lifestyle

Chronbach's alpha is very low for these variables, indicating that the variables `hr_sleep`, `smoking`, `fruit_veg` do not reliably measure the latent variable.

Since `healthy_lifestyle` is thus not reliably measured with these variables, we made the decision to exclude this latent variable from SEM analysis.

Outcome Variable: Mental Health Continuum Short Form (MHC-SF)

During the past month, how often did you feel …	NEVER (0)	ONCE OR TWICE (1)	ABOUT ONCE A WEEK (2)	ABOUT 2 OR 3 TIMES A WEEK (3)	ALMOST EVERY DAY (4)	EVERY DAY (5)
1. happy						
2. interested in life						
3. satisfied						
4. that you had something important to contribute to society						
5. that you belonged to a community (like a social group, or your neighborhood)						
6. that our society is becoming a better place for people like you						

Mental Health Continuum Short Form (MHC-SF)

Outcome Variable: MHC-SF

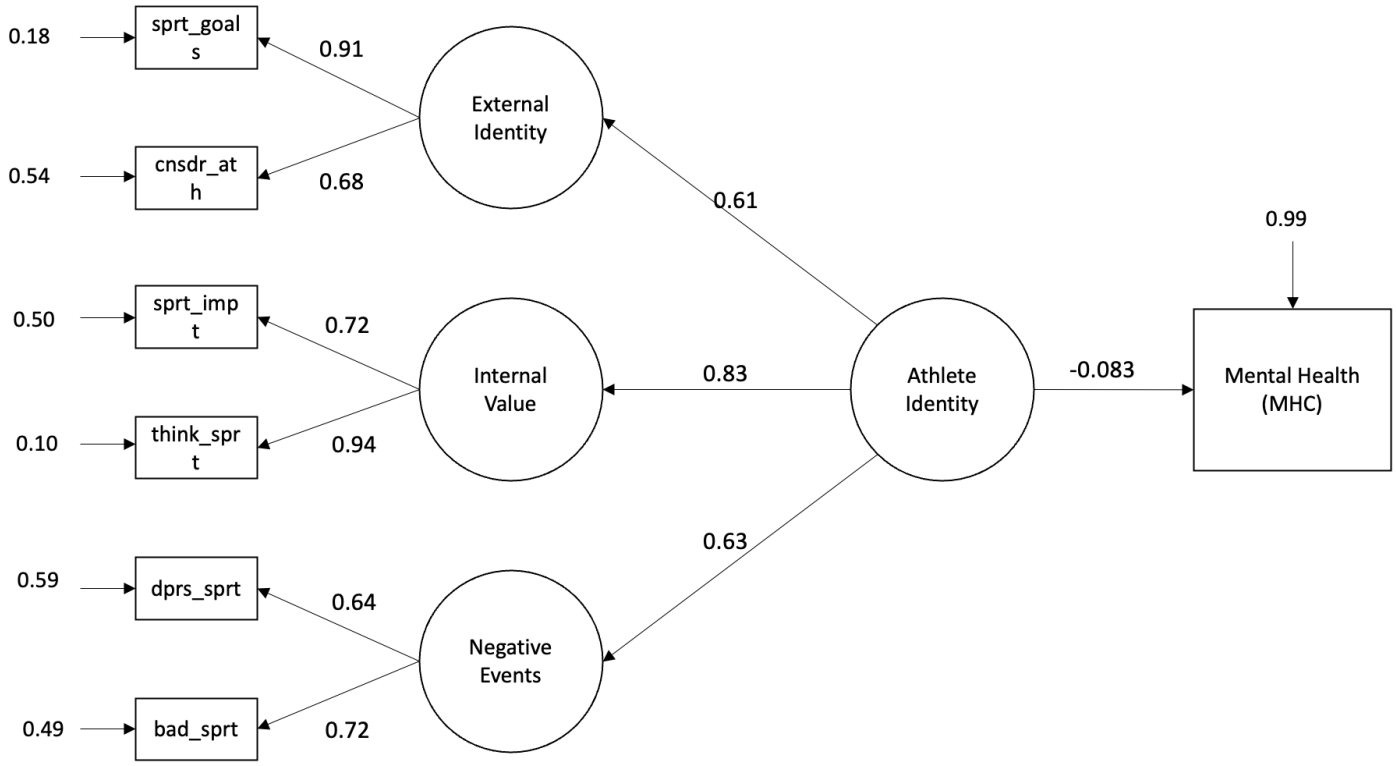
Three components of well-being are assessed:

- Emotional
- Social
- Psychological

We will use the MHC-SF composite score (sum of all responses) as our outcome variable. Higher scores indicate greater levels of positive well-being.

SEM 1: Athletic Identity and MHC-SF

Model 1: Relationship between Athlete Identity and Mental Health (MHC) for Athletes



*Standardized Path Coefficients

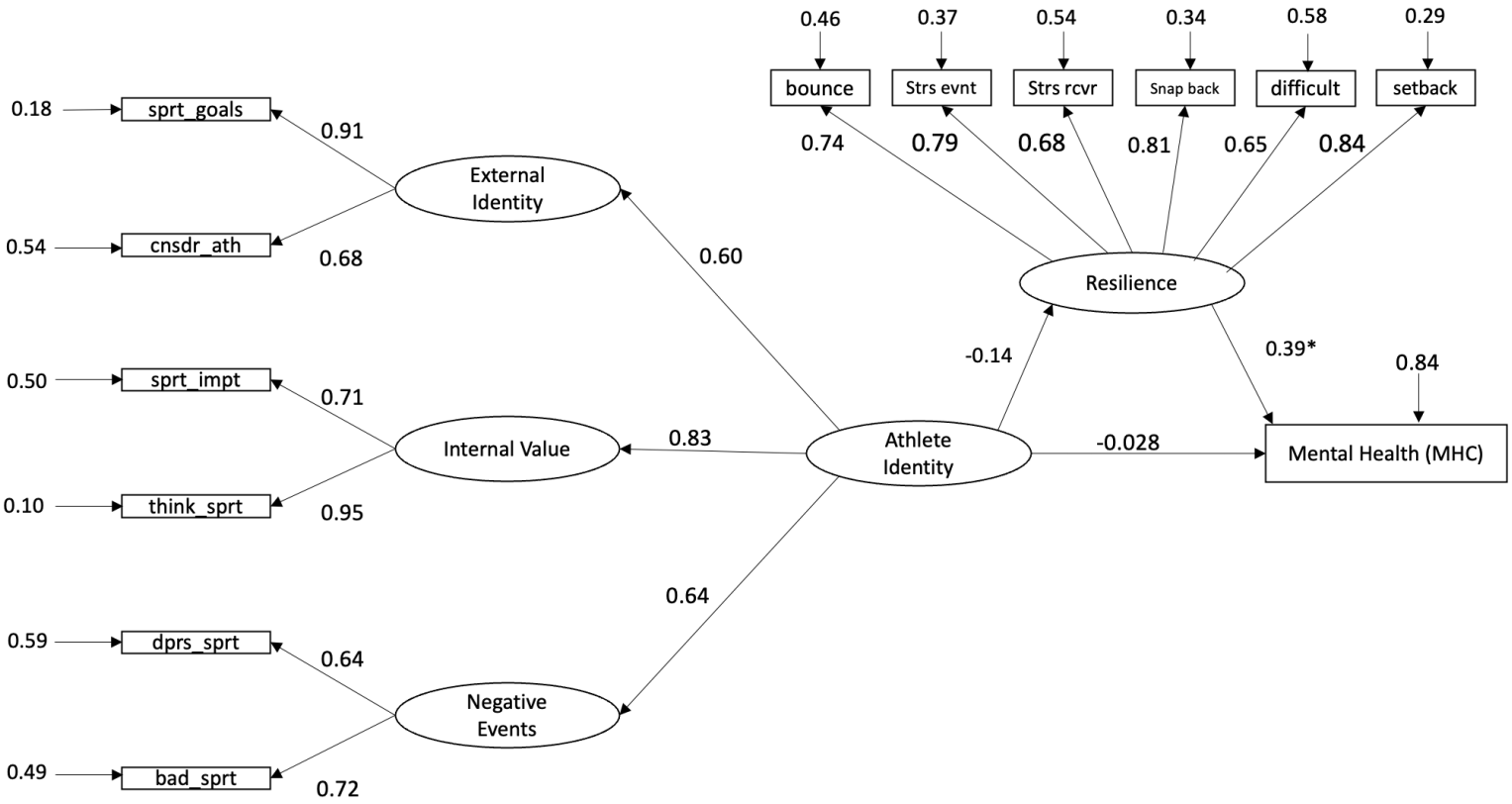
SEM 1: Direct Effect

We found that though the estimated effect between athletic identity and MHC-SF score is negative, indicating that a stronger athletic identity decreases overall well-being, the p-value associated with this value is 0.232.

Therefore, we conclude that there is **no** significant relationships between athletic identity and overall well-being.

SEM 2: Resilience, Athletic Identity, and MHC-SF

Model 2: Relationship between Athlete Identity and Mental Health (MHC) Mediated by Resilience for Athletes



Standardized Path Coefficients
Note: Value with * is significant at 0.05

SEM 2: Direct Effects

The estimated direct effect between resilience and MHC-SF is positive and statistically significant (p-value > 0.05), indicating that greater resilience increases overall well-being.

We found that estimated direct effect between athletic identity and resilience is negative, indicating that stronger athletic identity decreases resilience. However, this effect was again indicated to **not** be significant.

SEM 2: Indirect Effect

```
Defined Parameters:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    indrct_thlt_dn   -1.374    0.732   -1.877    0.061   -0.724   -0.056
    ttl_thlt_dntty   -2.054    1.669   -1.231    0.218   -1.082   -0.084
```

SEM 3: Comparison of Athletes and Non-Athletes

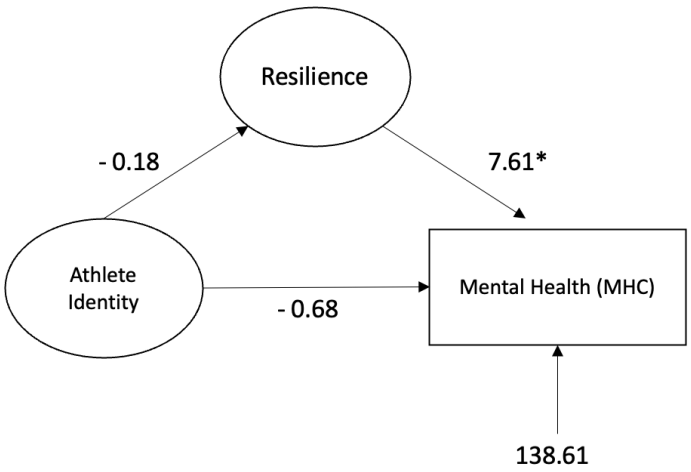
We were interested in seeing if there are differences in the effects of athletic identity, resilience, and MCH-SF score between athletes and non-athletes.

To do so, we will construct two SEMs, with unstandardized coefficients, to compare these two groups.

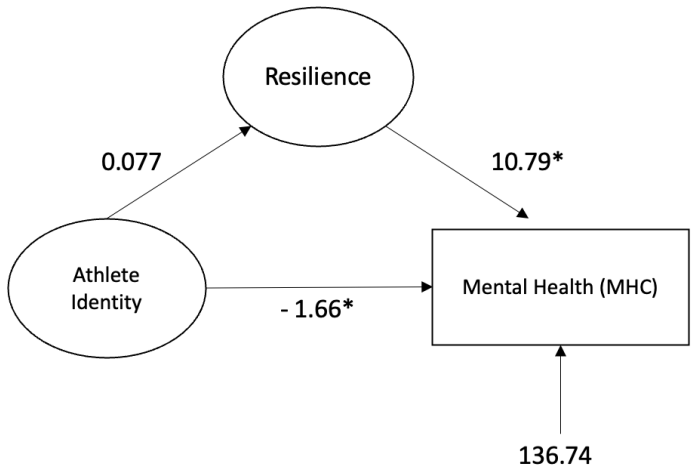
SEM 3: Comparison of Athletes and Non-Athletes

Comparison of Mediation Effect of Resilience on Relationship between Athlete Identity and Mental Health for Athletes and Non-Athletes

Athlete SEM with Unstandardized Coefficients



Non-Athlete SEM with Unstandardized Coefficients



Note: Value with * is significant at 0.05

Note: diagrams simplified for readability.

SEM 3: Indirect & Total Effect

- Indirect/Total effect of athletic identity among athletes

```
Defined Parameters:
                   Estimate  Std.Err  z-value  P(>|z|)
    indrct_thlt_dn   -1.374    0.732   -1.877    0.061
    ttl_thlt_dntty   -2.054    1.669   -1.231    0.218
```

- Indirect/Total effect of athletic identity among non-athletes

```
Defined Parameters:
                   Estimate  Std.Err  z-value  P(>|z|)
    indrct_thlt_dn    0.833    0.545    1.527    0.127
    ttl_thlt_dntty   -0.824    0.866   -0.951    0.341
```

SEM: Conclusion

Athletic identity was not found to be significantly associated with overall well-being for athletes in either model.

Resilience was significantly related to overall well-being for both athletes and non-athletes.

- This characteristic had a higher impact on overall well-being in non-athletes than it did in athletes.
- Also had a greater effect on overall well-being than athletic identity, in general.

Athletic identity had a significant negative direct effect on overall well-being for non-athletes, about 2.5 times the magnitude of the corresponding effect for athletes.

Discussion

Given the context of this survey, a lack of access to one's sport is a possible explanation for the negative effect athletic identity seems to have produced on overall well-being.

The differences in direct effects between athletic identity and overall well-being between athletes and non-athletes is difficult to account for

- Perhaps one possible explanation for the well-being of non-athletes being affected far more than the well-being of athletes by one's reported athletic identity is that though COVID-19 made playing a sport different/difficult universally, athletes may have had more resources at their disposal (i.e., support from coaches, other athletic professionals, etc.)

Our findings for resilience as a trait that is positively associated with mental health and overall well-being agrees with previous research.

Limitations and Recommendations for Future Study

The results of this study should be applied with caution – while making efforts to bolster one's resilience may be something to consider, some exercises to do so may be dangerous.

More variables may exist between the causal pathways we have defined (between athletic identity and overall well-being and perhaps even between athletic identity and resilience).

Treating the `healthy_lifestyle` latent variable as a formative (rather than a reflective) construct might more accurately reflect its nature and allow this construct to be used in SEM.

Demographic characteristics, such as sex, age group, and type of sport, are recommended to be included in future analysis.

Thank you!

Thank you!

Resources

1. Hu, T., Zhang, D., & Wang, J. (2014, December 13). A meta-analysis of the Trait Resilience and Mental Health. Personality and Individual Differences. https://www.sciencedirect.com/science/article/pii/S0191886914006710

2. Dale, H., Brassington, L., & King, K. (2014, March 5). The impact of healthy lifestyle interventions on Mental Health and Wellbeing: A systematic review. Mental Health Review Journal. https://www.emerald.com/insight/content/doi/10.1108/MHRJ-05-2013-0016/full/html

3. A cross-cultural psychometric evaluation of the Athletic Identity Measurement Scale. Taylor & Francis. (n.d.). https://www.tandfonline.com/doi/full/10.1080/10413200802415048

4. The brief resilience scale. Evaluating wellbeing. (2021, March 15). https://measure.whatworkswellbeing.org/measures-bank/brief-resilience-scale/

Resources

5. Fung S. F. (2020). Validity of the Brief Resilience Scale and Brief Resilient Coping Scale in a Chinese Sample. International journal of environmental research and public health, 17(4), 1265. https://doi.org/10.3390/ijerph17041265

6. Mental health continuum short form. Lee Kum Sheung Center for Health and Happiness. (2022, March 16). Retrieved May 3, 2022, from https://www.hsph.harvard.edu/health-happiness/mental-health-continuum-short-form/