

P8158 Final

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Interested Variables

Construct Reliability: Dedication to Sport/ athlete identity

```
athletic_identity <- c("cnsdr_ath", "sprt_goals", "frnds_ath", "sprt_impt", "think_sprt", "bad_sprt", "
```

Chronbach's alpha is 0.74, with a 95 % confidence interval of (0.70, 0.78).

Chronbach's alpha is 0.91, with a 95 % confidence interval of (0.90, 0.91).

Latent Variables

LV1:dedication_to_sport CNSDR_ATH: I consider myself an athlete SPRT_GOALS: I have many goals related to sport FRNDS_ATH: Most of my friends are athlete SPRT_IMPT: Sport is the most important part of my life THINK_SPRT: I spend more time thinking about sport than anything else SPRT_LVL: Sport level

LV2:positive_outlook HAPPY: Happy INT_LIFE: Interested in life SATISFIED: Satisfied CONT_SOC: That you had something important to contribute to society

LV3:interaction_society BELONG: That you belonged to a community (like a social group or neighbourhood) BET_SOC: That our society is becoming a better place for people like you PEOPLE_GOOD: That people are basically good SENSE_SOC: That the way our society works makes sense to you

LV4: maturity LIKE_PER: That you liked most parts of your personality RESPONSIBLE: Good at managing the responsibilities of your daily life WARM_REL: That you had warm and trusting relationships with others CHAL_EXP: That you had experiences that challenged you to grow and become a better person EXP_IDEA: Confident to think or express your own ideas and opinions MEANING: That your life has a sense of direction or meaning to it

LV5: resilience BOUNCE: I tend to bounce back quickly after hard times STRS_EVNT: I have a hard time making it through stressful events STRS_RCVR: It does not take me long to recover from a stressful event SNAP_BACK: It is hard for me to snap back when something bad happens DIFFICULT: I usually come through difficult times with little trouble SETBACKS: I tend to take a long time to get over setbacks in my life

```
athlete_sem2 <- '  
# measurement model  
external_identity =~ sprt_goals + cnsdr_ath + frnds_ath  
internal_value =~ sprt_impt + think_sprt  
negative_events =~ dprs_sprt + bad_sprt
```

```

athlete_identity =~ external_identity + internal_value + negative_events

healthy_lifestyle =~ hr_sleep + smoking + fruit_veg

resilience =~ bounce + str_s_evt + str_rcvr + snap_back + difficult + setbacks

# structural model - direct effects
mhc_sf ~ a*athlete_identity + b*healthy_lifestyle + c*resilience
resilience ~ d*athlete_identity
healthy_lifestyle ~ e*athlete_identity

# indirect
indirect_athlete_identity := d*c + e*b

# total
total_athlete_identity := d*c + a + e*b
,

athlete_sem_fit2 <- sem(athlete_sem2,
                        data = athletes,
                        sample.cov = TRUE,
                        missing = "ML")
summary(athlete_sem_fit2)

```

```

## lavaan 0.6-10 ended normally after 139 iterations
##
##      Estimator                      ML
##      Optimization method          NLMINB
##      Number of model parameters      58
##
##      Number of observations          363
##      Number of missing patterns      4
##
## Model Test User Model:
##
##      Test statistic                  202.637
##      Degrees of freedom              112
##      P-value (Chi-square)            0.000
##
## Parameter Estimates:
##
##      Standard errors                Standard
##      Information                    Observed
##      Observed information based on    Hessian
##
## Latent Variables:
##      Estimate  Std.Err  z-value  P(>|z|)
##      external_identity =~
##      sprt_goals      1.000
##      cnsdr_ath       0.947    0.096    9.848    0.000
##      frnds_ath       0.661    0.105    6.270    0.000
##      internal_value =~
##      sprt_impt       1.000

```

```

##      think_sprt          1.330    0.132   10.110    0.000
## negative_events =~
##      dprs_sprt          1.000
##      bad_sprt          1.296    0.208    6.240    0.000
## athlete_identity =~
##      external_dntty      1.000
##      internal_value      1.799    0.367    4.897    0.000
##      negative_evnts      0.951    0.176    5.415    0.000
## healthy_lifestyle =~
##      hr_sleep            1.000
##      smoking            -0.408    0.212   -1.927    0.054
##      fruit_veg          0.159    0.107    1.484    0.138
## resilience =~
##      bounce              1.000
##      strs_evnt          1.286    0.094   13.740    0.000
##      strs_rcvr          1.017    0.085   11.918    0.000
##      snap_back          1.227    0.087   14.137    0.000
##      difficult          0.968    0.086   11.208    0.000
##      setbacks           1.251    0.085   14.704    0.000
##
## Regressions:
##              Estimate Std.Err  z-value  P(>|z|)
## mhc_sf ~
##   athlt_dntt (a)      -1.679    1.822   -0.921    0.357
##   hlthy_lfst (b)       5.910    3.576    1.653    0.098
##   resilience (c)       6.963    1.140    6.105    0.000
## resilience ~
##   athlt_dntt (d)      -0.177    0.096   -1.848    0.065
## healthy_lifestyle ~
##   athlt_dntt (e)       0.144    0.211    0.683    0.495
##
## Intercepts:
##              Estimate Std.Err  z-value  P(>|z|)
## .sprt_goals          5.067    0.051   99.244    0.000
## .cnsdr_ath           5.876    0.059   99.891    0.000
## .frnds_ath           5.225    0.073   71.430    0.000
## .sprt_impt           5.109    0.080   63.958    0.000
## .think_sprt          4.904    0.081   60.569    0.000
## .dprs_sprt           5.666    0.066   85.290    0.000
## .bad_sprt            5.505    0.076   72.194    0.000
## .hr_sleep           11.543    0.112  103.085    0.000
## .smoking             1.565    0.056   27.741    0.000
## .fruit_veg           0.554    0.026   21.222    0.000
## .bounce              3.953    0.050   78.679    0.000
## .strs_evnt           3.351    0.060   55.906    0.000
## .strs_rcvr           3.565    0.055   64.519    0.000
## .snap_back           3.522    0.056   63.042    0.000
## .difficult           3.373    0.055   61.209    0.000
## .setbacks            3.578    0.055   65.245    0.000
## .mhc_sf              32.084    0.696   46.094    0.000
## .external_dntty      0.000
## .internal_value      0.000
## .negative_evnts      0.000
## athlete_idntty       0.000

```

```

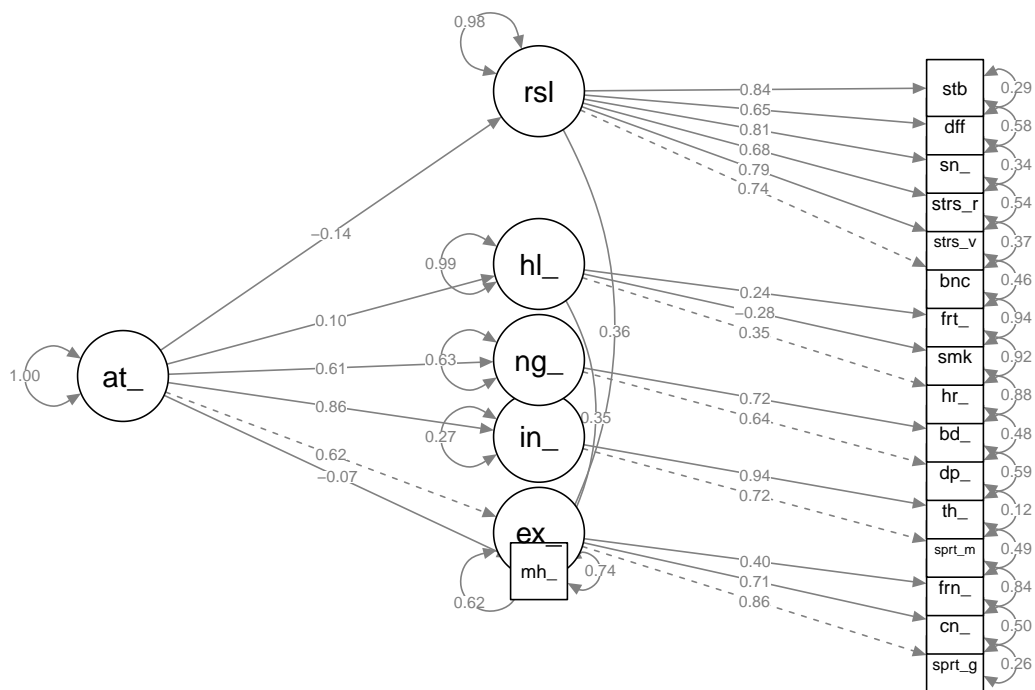
##      .healthy_lfstyl      0.000
##      .resilience        0.000
##
## Variances:
##              Estimate Std.Err z-value P(>|z|)
##      .sprt_goals      0.239   0.062   3.832   0.000
##      .cnsdr_ath       0.614   0.071   8.684   0.000
##      .frnds_ath       1.603   0.127  12.616   0.000
##      .sprt_impt       1.104   0.129   8.584   0.000
##      .think_sprt      0.269   0.175   1.537   0.124
##      .dprs_sprt       0.931   0.119   7.815   0.000
##      .bad_sprt        0.996   0.179   5.578   0.000
##      .hr_sleep        3.989   0.472   8.448   0.000
##      .smoking         1.061   0.104  10.174   0.000
##      .fruit_veg       0.233   0.021  11.175   0.000
##      .bounce          0.375   0.034  10.969   0.000
##      .strs_evnt       0.432   0.042  10.232   0.000
##      .strs_rcvr       0.530   0.046  11.404   0.000
##      .snap_back       0.346   0.035   9.898   0.000
##      .difficult       0.567   0.049  11.624   0.000
##      .setbacks        0.282   0.031   9.115   0.000
##      .mhc_sf          120.073  16.487   7.283   0.000
##      .external_dntty  0.425   0.076   5.569   0.000
##      .internal_value  0.312   0.155   2.009   0.045
##      .negative_evnts  0.401   0.099   4.064   0.000
##      athlete_idntty  0.264   0.068   3.887   0.000
##      .healthy_lfstyl  0.557   0.399   1.397   0.162
##      .resilience     0.432   0.059   7.334   0.000
##
## Defined Parameters:
##              Estimate Std.Err z-value P(>|z|)
##      indrct_thlt_dn  -0.382   1.497  -0.255   0.799
##      ttl_thlt_dntty  -2.061   1.700  -1.212   0.226

```

```

semPaths(athlete_sem_fit2,
  what = "paths",
  whatLabels = "std",
  reorder = FALSE,
  layout = "tree2",
  rotation = 2,
  intercepts = FALSE)

```



Boxplot of MHC_SF between athlete and non-athlete

```
library(tidyverse)

knitr::opts_chunk$set(
  fig.width = 6,
  fig.asp = .6,
  out.width = "90%"
)

theme_set(theme_classic() + theme(legend.position = "bottom"))

options(
  ggplot2.continuous.colour = "brewer",
  ggplot2.continuous.fill = "brewer"
)

scale_colour_discrete = scale_colour_viridis_d
scale_fill_discrete = scale_fill_viridis_d

# MHC_SF
MHC_SF <- c("mhc_sf", "athlete_yn")

MHC_SF_numeric <- dataset[,MHC_SF] %>% mutate(
```

```

mhc_sf= as.numeric(mhc_sf),
athlete_yn = as.factor( athlete_yn)) %>% mutate(
  athlete_yn = case_when(
    athlete_yn == "1" ~ "Athlete",
    athlete_yn == "2" ~ "Non-athlete"
  )
)

# Resilience
resilience <- c( "athlete_yn","bounce", "strs_evnt", "strs_rcvr", "snap_back", "difficult", "setbacks")

resilience_numeric <- dataset[,resilience] %>% map_df(., as.numeric) %>% mutate(
  athlete_yn = case_when(
    athlete_yn == "1" ~ "Athlete",
    athlete_yn == "2" ~ "Non-athlete"
  )
)

resilience_matrix <- resilience_numeric %>% as.matrix()

ath_resilience_numeric = resilience_numeric %>% mutate(
  total_resilience_score = bounce + strs_evnt + strs_rcvr + snap_back + difficult + setbacks,
  athlete_yn= as.factor(athlete_yn)
)

athe_res = cbind(MHC_SF_numeric, ath_resilience_numeric[,8])
colnames(athe_res) = c("Sum_Score_MHC", 'athlete_yn', 'Total_Resilience_Score')
gtsummary::tbl_summary(athe_res, by = athlete_yn) %>% add_p() %>% add_n()

```

| Characteristic | N | Athlete, N = 363 | Non-athlete, N = 390 | p-value |
|------------------------|-----|-------------------|----------------------|---------|
| Sum_Score_MHC | 688 | 45 (35, 53) | 46 (34, 55) | 0.4 |
| Unknown | | 30 | 35 | |
| Total_Resilience_Score | 661 | 22.0 (18.0, 24.0) | 21.0 (17.0, 24.0) | 0.047 |
| Unknown | | 41 | 51 | |

correlation

```

external = dataset[,18:19] %>% map_df(., as.numeric) %>% mutate(external_score = (cnsdr_ath + sprt_goal)
internal = dataset[,21:22] %>% map_df(., as.numeric) %>% mutate(internal_score = (sprt_impt + think_sprt)
negative = dataset[,23:24] %>% map_df(., as.numeric) %>% mutate(negative_score = (dprs_sprt + bad_sprt)/2)

cor_data = cbind(athe_res,external,internal, negative) %>%
  mutate(
    total_AIMS = (external_score + internal_score + negative_score)/3
  )

```

```
cor_data_2 = cor_data %>% select(Sum_Score_MHC, athlete_yn, Total_Resilience_Score,external_score, internal_score)

library(corrplot)
round(cor(cor_data_2[-2] %>% na.omit()),digits = 2) %>% knitr::kable()
```

| | Sum_Score_MHC | Total_Resilience_Score | external_score | internal_score | negative_score | total_AIMS |
|------------------------|---------------|------------------------|----------------|----------------|----------------|------------|
| Sum_Score_MHC | 1.00 | 0.51 | 0.09 | -0.04 | -0.13 | -0.03 |
| Total_Resilience_Score | 0.51 | 1.00 | 0.12 | 0.02 | -0.07 | 0.03 |
| external_score | 0.09 | 0.12 | 1.00 | 0.64 | 0.60 | 0.87 |
| internal_score | -0.04 | 0.02 | 0.64 | 1.00 | 0.55 | 0.86 |
| negative_score | -0.13 | -0.07 | 0.60 | 0.55 | 1.00 | 0.83 |
| total_AIMS | -0.03 | 0.03 | 0.87 | 0.86 | 0.83 | 1.00 |

```
tbl_summary(cor_data_2, by = athlete_yn) %>% add_p()
```

| Characteristic | Athlete, N = 363 | Non-athlete, N = 390 | p-value |
|------------------------|-------------------|----------------------|---------|
| Sum_Score_MHC | 45 (35, 53) | 46 (34, 55) | 0.4 |
| Unknown | 30 | 35 | |
| Total_Resilience_Score | 22.0 (18.0, 24.0) | 21.0 (17.0, 24.0) | 0.047 |
| Unknown | 41 | 51 | |
| external_score | 6.00 (5.50, 7.00) | 4.50 (2.50, 5.00) | <0.001 |
| Unknown | 7 | 228 | |
| internal_score | 5.00 (4.00, 6.00) | 4.00 (2.00, 5.00) | <0.001 |
| Unknown | 7 | 228 | |
| negative_score | 6.00 (5.00, 6.50) | 4.75 (3.00, 5.50) | <0.001 |
| Unknown | 7 | 228 | |
| total_AIMS | 5.67 (5.00, 6.17) | 4.33 (3.00, 5.17) | <0.001 |
| Unknown | 7 | 228 | |