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 ten-d 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
```

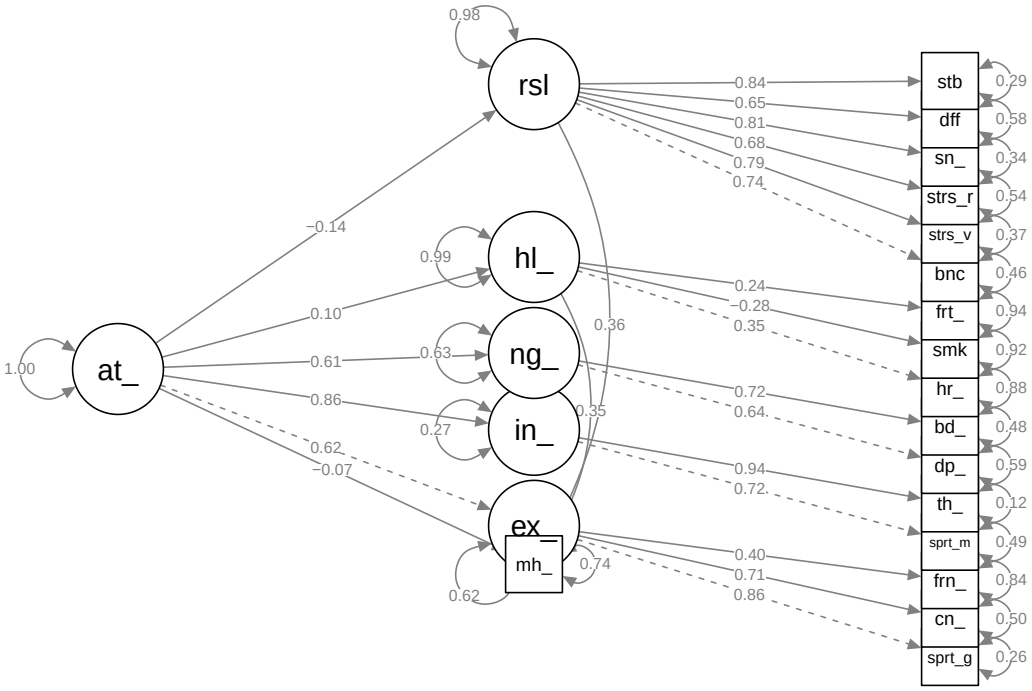
```
    athlete_identity =~ external_identity + internal_value + negative_events

    healthy_lifestyle =~ hr_sleep + smoking + fruit_veg

    resilience =~ bounce + strs_evnt + strs_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_goals

internal = dataset[,21:22] %>% map_df(., as.numeric) %>% mutate(internal_score = (sprt_impt + think_spr

negative = dataset[,23:24]%>% map_df(., as.numeric) %>% mutate(negative_score = (dprs_sprt + bad_sprt)/

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, inte

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

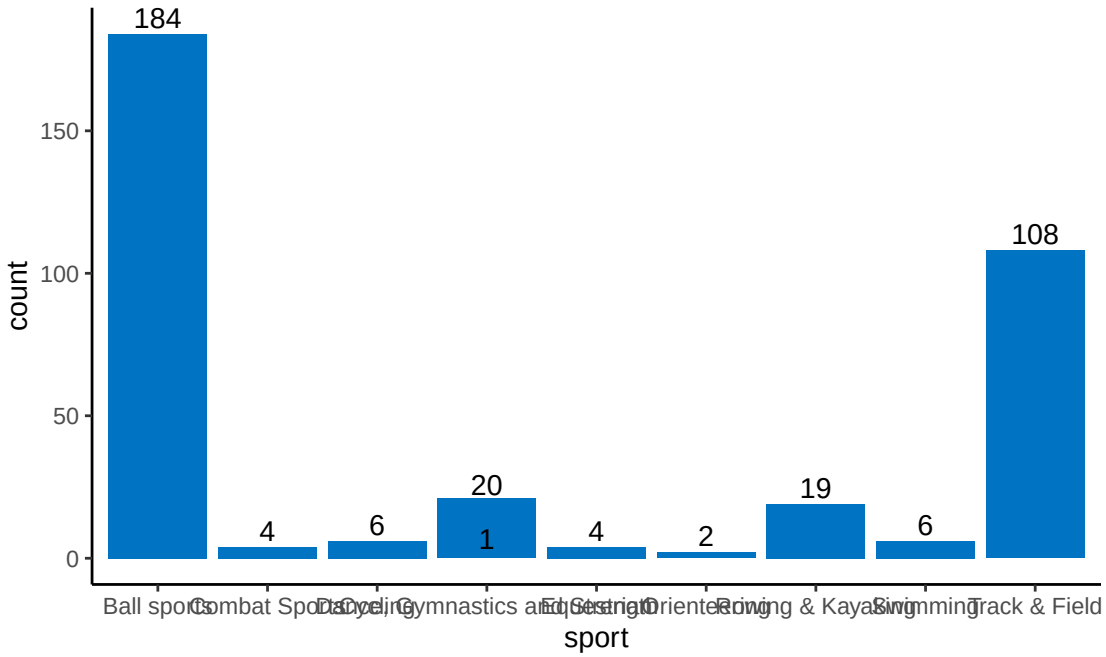
```
tbl_summary(cor_data_2, by = athlete_yn) %>% add_p()
```

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	

```
male_female = dataset %>% select(gender, athlete_yn,age_grp)%>%
  mutate(
    gender = case_when(
      gender == 1 ~ "Male",
      gender == 2 ~ "Female"
    ),
    athlete_yn = case_when(
      athlete_yn == 1 ~ "Athlete",
      athlete_yn == 2 ~ "Non-athlete"
    ),
    age_grp = case_when(
      age_grp == 1 ~ "18-20",
      age_grp == 2 ~ "21-30",
      age_grp == 3 ~ "31-40",
      age_grp == 4 ~"41-50",
      age_grp == 5 ~ "51-60",
      age_grp == 6 ~ "61-70",
      age_grp == 7 ~"71+"
    ))

gtsummary::tbl_summary(male_female, by = athlete_yn)
```

Characteristic	**Athlete**, N = 363	**Non-athlete**, N = 390
gender		
Female	162 (45%)	238 (61%)
Male	201 (55%)	152 (39%)
age_grp		
18-20	59 (16%)	14 (3.6%)
21-30	127 (35%)	76 (19%)
31-40	86 (24%)	96 (25%)
41-50	61 (17%)	98 (25%)
51-60	21 (5.8%)	52 (13%)
61-70	7 (1.9%)	41 (11%)
71+	2 (0.6%)	13 (3.3%)

```
sport = dataset %>%  select(athlete_yn, sprt) %>% mutate(
  sprt = case_when(
      sprt == 1 ~ "Ball sports",
      sprt == 2 ~ "Track & Field",
      sprt == 3 ~ "Dance, Gymnastics and Strength",
      sprt == 4 ~"Rowing & Kayaking",
      sprt == 5 ~ "Cycling",
      sprt == 6 ~ "Swimming",
      sprt == 7 ~"Combat Sports",
      sprt == 8 ~"Equestrian",
      sprt == 9 ~"Orienteering")) %>%
  group_by(athlete_yn, sprt) %>% na.omit() %>% count() %>% arrange(n)

colnames(sport) = c("athlete_yn","sport","count")

ggplot(sport, aes(x = sport, y = count)) +
  geom_bar(fill = "#0073C2FF", stat = "identity")+
  geom_text(aes(label = count), vjust = -0.3)
```


184
4
6
20
1
4
2
19
6
108
150
100
50
0
count
Ball sports
Combat Sports
Cycling
Gymnastics and Dance
Equestrian
Orienteering
Rowing & Kayaking
Skiing
Swimming
Track & Field
sport