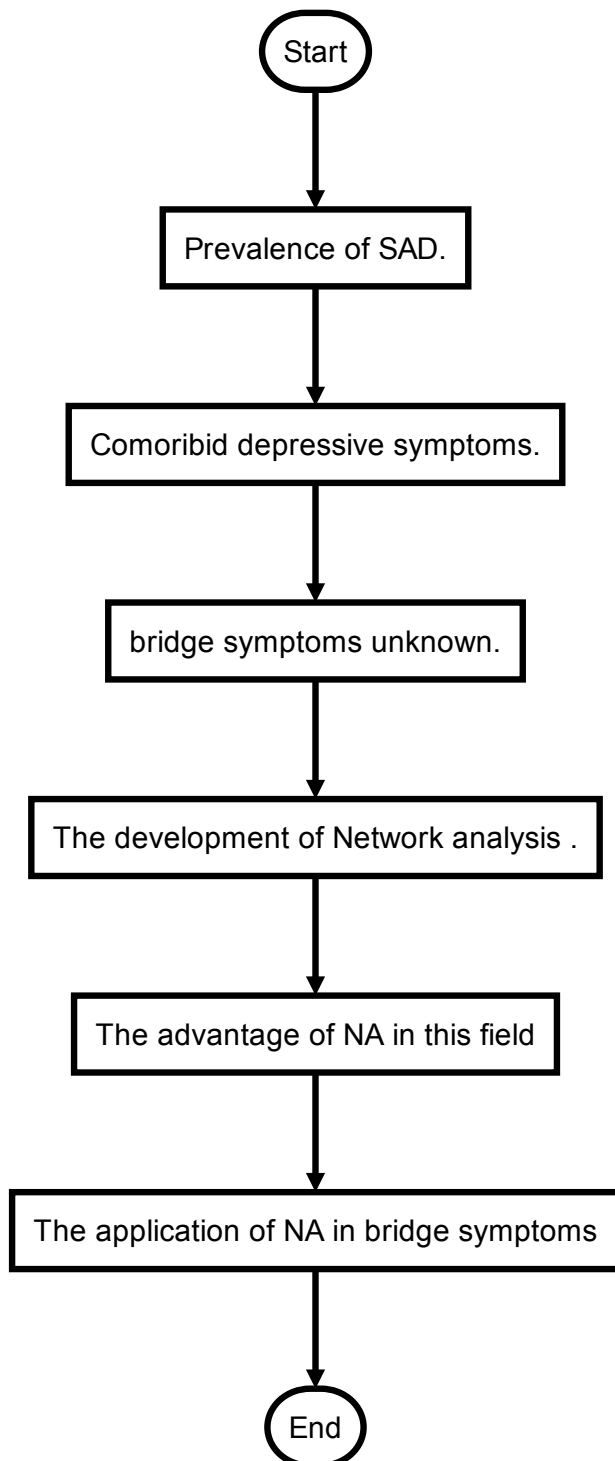


**Mapping network connectivity among symptoms of social anxiety and comorbid depression in people with social anxiety disorder[J]. Heeren A, Jones P J, McNally R J. J Affect Disord, 2018, 228:75-82.**

## **Background**



- In recent years, the theoretical (Borsboom, 2017; Borsboom and Cramer, 2013)

and computational (e.g., Epskamp et al., 2012) advances in network analysis have opened up new vistas for **understanding mental disorders as systems of interacting symptoms** (Borsboom, 2017; Fried et al., 2016; McNally, 2016). In recent years, the theoretical (Borsboom, 2017; Borsboom and Cramer, 2013) and computational (e.g., Epskamp et al., 2012) advances in network analysis have opened up new vistas for understanding mental disorders as systems of interacting symptoms (Borsboom, 2017; Fried et al., 2016; McNally, 2016). They are **not merely passive indicators of an underlying disease**.

Q: Learned the theory basis of network analysis, the references may be useful one day.

- Bridge symptoms:  
Symptom-to-symptom associations between two disorders (e.g. SAD and dep)  
**Find the core symptoms**

## Method:

- method
1. Sampling: convenience sample of individuals who were recruited for 5 other studies

Q: limitation

2. Eligibility: a) DSM b) no current substance abuse or dependence (c) no current neurological problems or use of psychotropic medications, and (d) no current psychological or psychiatric treatment.

Q: similar criteria to be learned

3. Measures:
  - a) SAD: (1) LSAS (24-item 4-point Likert) > 56 (2) MINI by psychologist
  - b) DEP: (1) BDI (21-item)

Q: as well as CES-D, measure the presence and severity of depressive symptoms.

Q: used the validated French versions of this scale, we can say 'used the validated Chinese versions of this scale' in our Methods.

- network analysis
1. graphical LASSO

a) compute (regularized) partial correlations between pairs of symptoms

b) shrink trivially small associations to zero

1.1 Tool: R package qgraph (Epskamp et al., 2012)

a) gLASSO with EBIC model selection

b) hyperparameter gamma, between zero to .5, the more the EBIC will favor a simple model.

c) correlation matrix polychoric correlations (e.g., McNally et al., 2017a)

## 2. Node centrality

a) EI1&EI2

b) Tool: R package networktools (Jones, 2017).

to calculate index of each node. For each index, higher index reflects greater influence in the network.

## 3. Node bridge influence

bridge function of *networktools*.

CI *bootnet*.

# Table

**Table 1**

Demographic and clinical measures for individuals with social anxiety disorder.

	Mean (SD)	Min-Max
<b>Demographic measures</b>		
Age	28.40 (11.26)	18–67
Educational level (in years)	10.78 (2.33)	0–15
<b>Clinical measures</b>		
BDI-II	12.86 (8.15)	1–37
LSAS	71.67 (13.69)	57–112

**Note.** Education level was assessed according to the numbers of years of education completed after finishing primary school. BDI-II = Beck Depression Inventory; LSAS = Liebowitz Social Anxiety Scale.

**Table 2**

Social situations indexed in the Liebowitz Social Anxiety Scale and depressive symptoms as denoted in the Beck Depression Inventory-II.

Construct	Items
Social situations	1. Telephoning in public; 2. Participating in small groups; 3. Eating in public places; 4. Drinking with others in public places; 5. Talking to people in authority; 6. Acting, performing or giving a talk in front of an audience; 7. Going to a party; 8. Working while being observed; 9. Writing while being observed; 10. Calling someone you don't know very well; 11. Talking with people you don't know very well; 12. Meeting strangers; 13. Urinating in a public bathroom; 14. Entering a room when others are already seated; 15. Being the center of attention; 16. Speaking up at a meeting; 17. Taking a test; 18. Expressing a disagreement or disapproval to people you don't know very well; 19. Looking at people you don't know very well in the eyes; 20. Giving a report to a group; 21. Trying to pick up someone; 22. Returning goods to a store; 23. Giving a party; 24. Resisting a high-pressure salesperson.
Depressive symptoms	1. Sadness; 2. Pessimism; 3. Past failure; 4. Loss of pleasure; 5. Guilty feelings; 6. Punishment feelings; 7. Self-dislike; 8. Self-criticalness; 9. Suicidal thoughts or wishes; 10. Crying; 11. Agitation; 12. Loss of interest; 13. Indecisiveness; 14. Worthlessness; 15. Loss of energy; 16. Changes in sleeping pattern; 17. Irritability; 18. Changes in appetite; 19. Concentration difficulty; 20. Tiredness or Fatigue; 21. Loss of interest in sex.

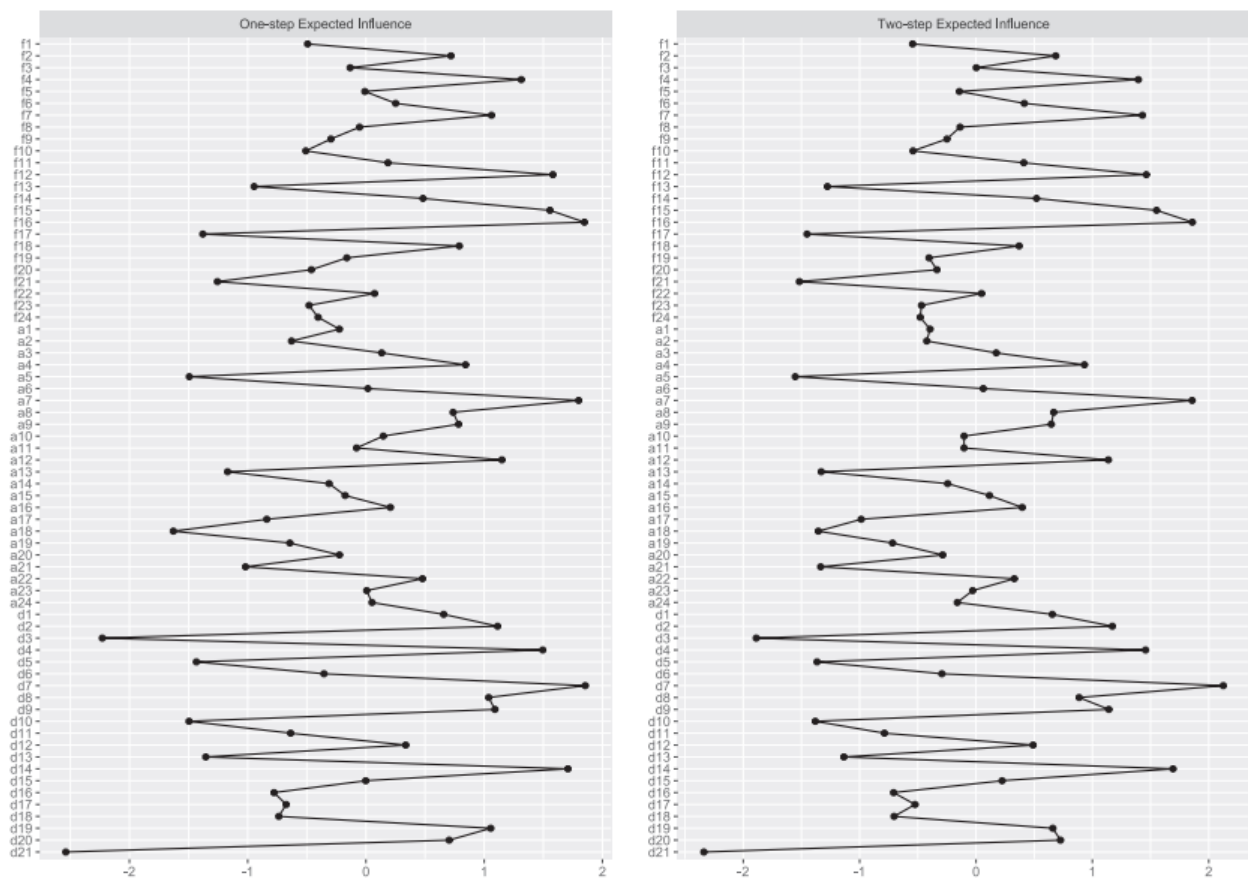
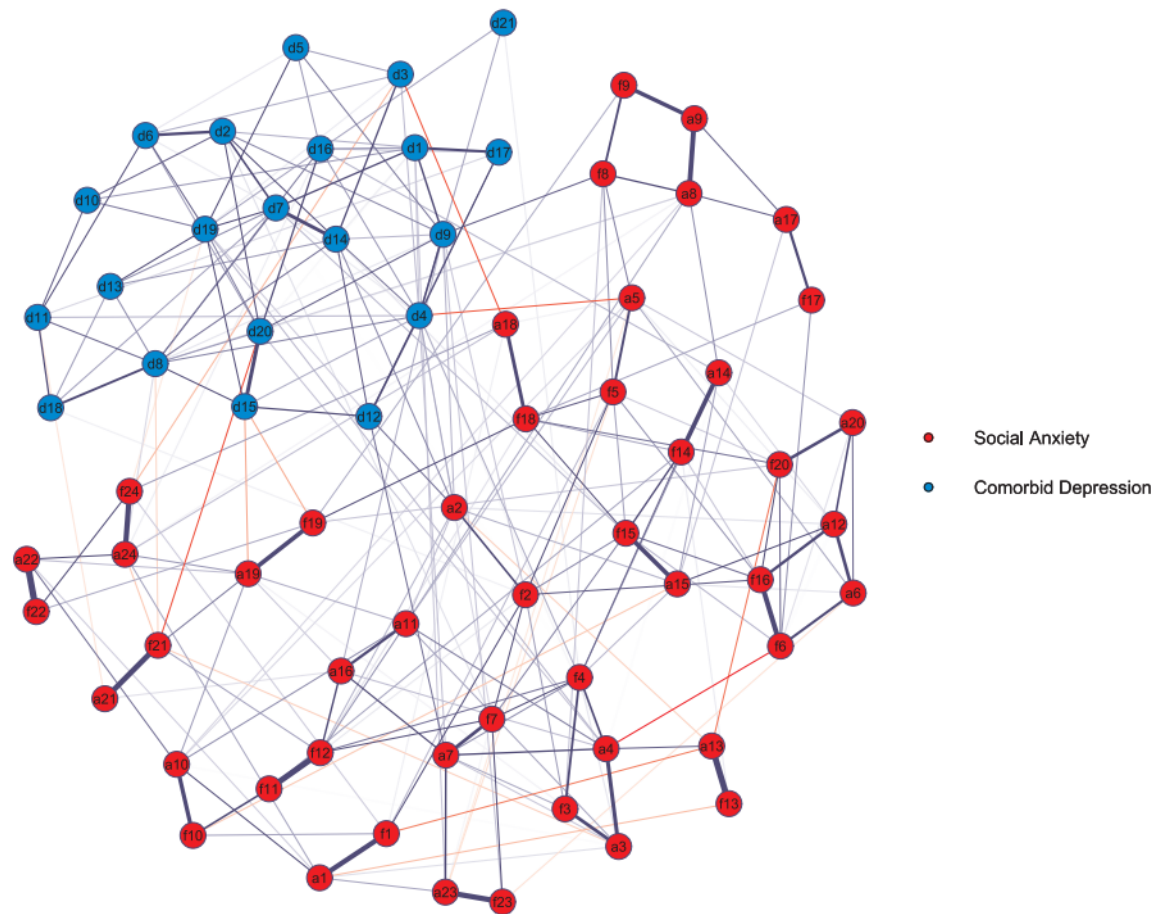


Fig. 2. Plot denoting the one-step and two-step expected influence metrics for the graphical LASSO network. Note. Items are detailed in Table 2.

## Results

Nodes denoting avoidance of participating in small groups (a2), avoidance of going to a party (a7), and fear of working while being observed (f8) were the SAD symptoms exhibiting the highest levels of both bridge EI1 and EI2 on all depressive symptoms. Suicidal ideation (d9) and loss of interest (d12) were the depressive symptoms exhibiting the highest

## Conclusions

1. found core symptoms
2. therapeutic implications
  - a) highly connected nodes : reduce the overall network connectivity
  - b) bridge nodes: affect the co-occurrence

## Limitations

1. cross-sectional data
2. relatively small sample size
3. patients had a primary diagnosis of SAD.
4. The participants were relatively well-educated and predominantly female.

the first to examine the cross-associations between core symptoms of SAD and comorbid depressive symptoms among individuals with SAD, thus providing an important basis for hypothesizing how the two disorders covary.

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## New words

psychotropic 治疗精神病的 psychotropic medication

spurious 虚假的 spurious associations

trade-off 权衡

gauge 测量

in keeping with 与.....一致

stress 强调

elucidate 阐明