

1. If the mind and the brain are identical, then the brain is a physical entity if and only if the mind is a physical entity. If the mind is a physical entity, then thoughts are material entities. Thoughts are not material, but the brain is a physical entity. Therefore, the mind and the brain are not identical.

Let I-the mind and brain are identical, B- the brain is a physical entity, M-the mind is a physical entity, and T-thoughts are material entities.

I	B	M	T	$I \supset (B \equiv M)$	$M \supset T$	$\neg T \cdot B$	$\neg I$
T	T	T	T	T	T	F	F
T	T	T	F	T	F	T	F
T	T	F	F	F	T	T	F
T	F	F	F	T	T	F	F
T	T	F	T	F	T	F	F
T	F	T	T	F	T	F	F
T	F	F	T	T	T	F	F
T	F	T	F	F	F	F	F
F	T	T	T	T	T	F	T
F	F	T	T	T	T	F	T
F	F	F	T	T	T	F	T
F	F	T	F	T	F	F	T
F	T	F	F	T	T	T	T
F	T	T	F	T	F	T	T
F	T	F	T	T	T	F	T
F	F	F	F	T	T	F	T

So, this argument is valid. Using the rules we have studied, we have:

- (a) $I \supset (B \equiv M)$
- (b) $M \supset T$
- (c) $\neg T \cdot B \quad / \therefore \neg I$
- (d) $\neg T$ (simp c)
- (e) B (simp c)
- (f) $\neg M$ (M.T b,d)
- (g) $B \cdot \neg M$ (conj. e,f)
- (h) $\neg \neg B \cdot \neg M$ (DN g)

- (i) $\neg(\neg B \vee M)$ (DeM h)
- (j) $\neg(B \supset M)$ (CE, i)
- (k) $\neg(B \supset M) \vee \neg(M \supset B)$ (Add j)
- (l) $\neg((B \supset M) \cdot (M \supset B))$ (DeM k)
- (m) $\neg(B \equiv M)$ (BE l)
- (n) $\neg I$ (M.T a,m)

2. If the cat is ill, either she was fighting or ate too many mice. She was fighting only if she was attacked, and she was attacked only if either the large Siamese or the small beagle was out. The large Siamese was out only if it was sunny, and the small beagle was out only if it was warm. It was neither warm nor sunny, but the cat is ill. Therefore, she ate too many mice.

Let I-the cat is ill, M- the cat ate too many mice, F - the cat was fighting, A- the cat was attacked, S-the large Siamese was out, B-the small beagle was out, U-it was sunny out, and W- it was warm out.

The argument is valid.

- (a) $I \supset (F \vee M)$
- (b) $(F \supset A) \cdot (A \supset (S \vee B))$
- (c) $(S \supset U) \cdot (B \supset W)$
- (d) $\neg(W \vee U) \cdot I \quad / \therefore M$
- (e) I (simp d)
- (f) $F \vee M$ (MP a,e)
- (g) $F \supset A$ (simp b)
- (h) $\neg F \vee A$ (CE g)
- (i) $M \vee A$ (DS f,h)
- (j) $A \supset (S \vee B)$ (simp b)
- (k) $\neg A \vee (S \vee B)$ (CE j)
- (l) $A \vee M$ (comm i)
- (m) $M \vee (S \vee B)$ (DS k,l)
- (n) $S \supset U$ (simp c)
- (o) $\neg(W \vee U)$ (simp d)
- (p) $\neg W \cdot \neg U$ (DeM O)
- (q) $\neg U \cdot \neg W$ (comm p)
- (r) $\neg W$ (simp q)
- (s) $\neg U$ (simp q)
- (t) $\neg S$ (MT n,s)
- (u) $B \supset W$ (simp c)
- (v) $\neg B$ (MT r,u)

- (w) $\neg S \cdot \neg B$ (conj t,v)
- (x) $\neg(S \vee B)$ (DeM w)
- (y) $(S \vee B) \vee M$ (comm m)
- (z) M (DS x,y)

3. If I drink too much coffee, then I can't sleep well and I don't study properly. If I don't drink enough coffee, I can't stay awake and I don't study at all. Either I drink too much coffee or not enough. Therefore, I either don't study at all or I don't study properly.

Let O- drink too much coffee, S -sleeps well, P - studies properly, E - drinks enough coffee, A - stays awake, T- studies at all.

The argument is valid.

- (a) $O \supset (\neg S \cdot \neg P)$
- (b) $\neg E \supset (\neg A \cdot \neg T)$
- (c) $O \vee \neg E \quad / \therefore \neg T \vee \neg P$
- (d) $\neg E \vee O$ (comm c)
- (e) $E \supset O$ (CE d)
- (f) $E \supset (\neg S \cdot \neg P)$ (HS e)
- (g) $\neg(\neg S \cdot \neg P) \supset \neg E$ (contra f)
- (h) $\neg(\neg S \cdot \neg P) \supset (\neg A \cdot \neg T)$ (HS g)
- (i) $(\neg S \cdot \neg P) \vee (\neg A \cdot \neg T)$ (CE h)
- (j) $((\neg S \cdot \neg P) \vee \neg A) \cdot ((\neg S \cdot \neg P) \vee \neg T)$ (Dist. i)
- (k) $(\neg S \cdot \neg P) \vee \neg T$ (simp j)
- (l) $\neg T \vee (\neg S \cdot \neg P)$ (comm k)
- (m) $(\neg T \vee \neg S) \cdot (\neg T \vee \neg P)$ (Dist l)
- (n) $\neg T \vee \neg P$ (simp m)

4. If the Monetarists are right, then there is an increase in inflation if and only if the money supply increases too fast. If the Keynesians are right, then there is an increase in inflation if and only if there is a decrease in unemployment. If the Libertarians are right, there is an increase in inflation if and only if the federal government spends more than it takes in. The money supply increases too fast only if taxes are too low, and the federal government spends more than it takes in only if taxes are too low. There is no decrease in unemployment and taxes are not too low, but there is an increase in inflation. Therefore, neither the Monetarists, the Keynesians, nor the Libertarians are right.

The argument is valid.

Let M-Monetarists, I-inflation rises, S- money supply increases, K-Keynesians, D- employment decreases, L- Libertarians, F- federal government spends more than it takes in,and T- taxes are not too low.

- (a) $M \supset (I \equiv S)$
- (b) $K \supset (I \equiv D)$
- (c) $L \supset (I \equiv F)$
- (d) $(S \supset T) \cdot (F \supset T)$
- (e) $(\neg D \cdot \neg T) \cdot I \quad \neg(M \vee (K \vee L))$
- (f) $M \supset ((I \supset S) \cdot (S \supset I))$ (BE a)
- (g) $K \supset ((I \supset D) \cdot (D \supset I))$ (BE b)
- (h) $L \supset ((I \supset F) \cdot (F \supset I))$ (BE c)
- (i) $M \supset I$ (HS f)
- (j) $K \supset I$ (HS g)
- (k) $L \supset I$ (HS h)
- (l) $\neg M \vee I$ (CE i)
- (m) $\neg K \vee I$ (CE j)
- (n) $\neg L \vee I$ (CE k)
- (o) $\neg M$ (Add. l)
- (p) $\neg K$ (Add. m)
- (q) $\neg L$ (Add. n)
- (r) $\neg M \cdot \neg K \cdot \neg L$ (conj. o,p,q)
- (s) $\neg(M \vee K \vee L)$ (DeM r)
- (t) $\neg(M \vee (K \vee L))$ (Assoc. s)